



# Quetico

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## Forest Fire Management Plan

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Prepared by:



ONTARIO  
PARKS





## Quetico Provincial Park Fire Management Plan - Approvals

I am pleased to present the Quetico Provincial Park Fire Management Plan which describes fire management projects that will recur during the next ten years (2009-2019). The projects described in the draft Quetico Fire Management Plan have been screen to category A and category B under the Class Environmental Assessment for Provincial Parks and Conservation Reserves.

Copies of the fire management plan for Quetico Provincial Park will be available at the Fort Frances District office; the Atikokan Area office; the Fort Frances Fire Management Headquarters; the Ontario Parks Northwest Zone office; the Ministry Emergency Operating Centre in Sault Ste. Marie; the Regional Fire Management Centre Response Unit; and with the the Quetico Park Superintendent.

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## Glossary of Terms

Many of the terms listed are found in the 2000 Glossary of Forest Fire Management Terms (Canadian Interagency Forest Fire Centre CIFFC) and the Forest Management Planning Manual (OMNR). Other terms included are as generally accepted and understood in the Ontario Ministry of Natural Resources.

**Backfiring (Backfired)** - A form of indirect attack where extensive fire is set along the inner edge of a control line or natural barrier, usually some distance from the wildfire and taking advantage of in drafts, to consume fuels in the path of the fire, and thereby halt or retard the progress of the fire front.

**Burning Out (Burnout)** - A fire suppression operation where fire is set along the inside edge of a control line or natural barrier to consume unburned fuel between the line and the fire perimeter.

**Detection:** A system for or the act of discovering, locating and reporting forest fires.

**Direct Attack:** A method whereby the fire is attacked immediately adjacent to the burning fuel (*Note: This is generally accomplished by the individual or combined use of aircraft, hose, pumps and hand tools to extinguish the fire. Primarily used when the fire management objective is to minimize area burned*).

**Ecosystem:** A biological community of interacting organisms and their physical environments.

**Ecosystem Renewal Area Burned:** Areas that burn and do not impact wood supply. This includes islands, parks and protected areas such as Provincial Parks and Conservation Reserves, and remote areas in the northern portion of the province.

**Fire Assessment Report (FAR):** A report prepared by the Incident Commander, which is a collection of Fire Impact Assessment information in standard format, for consideration by the Fire Region for priority setting and further analysis. The analysis leads to a decision to establish a priority for fires and to maintain, increase, decrease or discontinue the fire suppression effort such that costs and/or damage are minimized, and/or benefits from the fire are maximized.

**Fire Behaviour:** The manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather, and topography.

**Fire Cycle:** The average number of years required to burn an area equal to the total area of interest.

**Fire Intensity:** The rate of heat energy released from a flaming fire front per unit time per unit length of flame front.

**Fire Load:** The number and magnitude (i.e. fire size class and fire intensity) of all fires requiring suppression action during a given period within a specified area.

**Fire Management:** The activities concerned with the protection of people, property, and forest areas from wildfire through managed fire response, and the use of prescribed fire for the attainment of forest management and land management goals and objectives, all conducted in a manner that considers environmental, social and economic criteria.

**Fire Management Zone:** A geographic area characterized by similar forest types and fire loads and by similar impacts of fires on society, wood supply, tourism, and the ecosystem.

**Fire Prevention:** Activities directed at reducing fire occurrence; includes public education, law enforcement, personal contact and reduction of fire hazards and risks

**Fire Protection:** In fire management, it is the aggregate amount of fire management activity that is applied to a management area (see level of protection).

**Fire Regime:** The kind of fire activity or pattern of fires that generally characterize a given area.

**Fire Season:** April 1 to October 31 of each year as defined by the Forest Fire Prevention Act (FFPA).

**First Nation:** A community as defined by the Indian Act (Canada).

**Forest Fire:** Any fire burning in forested areas, grass, or alpine/tundra vegetation ---synonymous with Fire.

**Forest Fires Prevention Act (FFPA):** An Act of the Ontario legislature that mandates the Minister of Natural Resources to provide forest fire protection in the fire region of Ontario as defined by the FFPA.

**Fuelbreak** - An existing barrier or change in fuel type (to one that is less flammable than that surrounding it), or a wide strip of land on which the native vegetation has been modified or cleared, that act as a buffer to fire spread so that fires burning into them can be more readily controlled. Often selected or constructed to protect a high value area from fire. In the event of fire, may serve as a control line from which to carry out suppression operations.

**Fuels:** Wildland vegetation materials that can burn. While usually referring to aboveground living and dead wildland surface vegetation, roots and organic soils such as peat often are included.

**Fuel Management:**

The planned manipulation and/or reduction of living or dead forest fuels for forest management and other land use objectives (e.g. hazard reduction, silvicultural purposes, wildlife habitat improvement) by: prescribed fire; mechanical, chemical, or biological means; and/or changing stand structure and species composition.

**Hazard Reduction:** A treatment of dead or dying forest fuels to diminish the chance of fire starting, and to lessen the potential rate of spread and resistance to control.

**Hazard Reduction Area Burned:**

Areas burned that are dead or dying as a result of insect infestations such as the spruce budworm or areas that have blown down. These areas will be identified by resource managers as candidate areas for Modified Response in an effort to return fuel conditions to fire origin species

**Human-Caused Fires:** A forest fire or wildfire caused by human carelessness, human activities or malicious use of fire.

**Indirect Attack:** A method whereby the control line is strategically located to take advantage of favourable terrain and boundaries in the advance of the fire perimeter and the intervening strip is usually burned out or back burned. The fire management objective is to extinguish, control or steer a fire to optimize the area burnt for ecological, fuel reduction or silvicultural purposes.

**Initial Attack:** The action taken to halt the spread or potential spread of a fire by the first fire fighting force to arrive at the fire.

**Level of Protection:** The amount of effort that a fire management organization is willing to expend to respond to forest fires based upon the organization's land and resources management objectives.

**Light on the Land:** Non-destructive methods of fire suppression, which do not unduly disturb the landscape and ecosystem.

**Managed Fire:** Any fire managed using full, modified or monitored response or a combination of response options to meet fire or resource management objectives - such that costs and/or damage are minimized and/or benefits from the fire are maximized.

**Modified Response Fire:** A fire that is managed using a combination of suppression techniques, including direct and indirect attack as well as monitoring

to steer, contain or otherwise manage fire activity within a predetermined perimeter such that costs and/or damage are minimized and/or benefits from the fire are maximized

**Monitored Response Fire:** A fire that is observed and assessed to determine the response option required to minimize social disruption and/or significant value and resource impacts while achieving beneficial ecological, economic or resource management objectives.

**Objective:** An object of action. An end as a cause of action

**Preparedness:** Condition or degree of being able and ready to cope with an anticipated fire situation.

**Prescribed Fire:** Forest fires deliberately utilized in a predetermined area in accordance with a pre-specified and approved burning prescription to achieve preset objectives.

**Prescribed Burning:** The deliberate, planned and knowledgeable application of fire by authorized personnel and in accordance with MNR policy and guidelines to a specific land area to accomplish pre-determined forest management or other land use objectives.

**Strategy:** The means or steps of achieving an objective.

**Suppression:** All activities concerned with controlling and extinguishing a fire following its detection.

**Sustainable Forest License (SFL):** Under the Crown Forest Sustainability Act, a Sustainable Forest License is a renewable license to harvest forest resources in a management unit that requires a licensee to carry out renewal and maintenance activities necessary to provide for the sustainability of the Crown forest in the area covered by the license. This type of license may be granted for up to 20 years (CFSA).

**Sustained Attack:** Conducting fire suppression action on a wildfire for an extended period of time.

**Values:** The specific or collective set of natural resource and human-made development/improvements that have measurable or intrinsic worth and that may be destroyed or otherwise altered by fire in any given area.

**Wildfire:** The specific or collective set of natural resources and human-made development/improvements that have measurable or intrinsic worth and that may be destroyed or otherwise altered by fire in any given area; any unwanted forest fire.

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## 1.0 Introduction

Natural disturbances, including fire, blowdown, insect infestation and disease are critical to maintaining the forest and grassland communities in Ontario. A lack of fire disturbance in the last century across Ontario has not only increased the frequency of other disturbance events (e.g. blow down, insect infestation and disease) but it has also altered the natural fire regimes across Ontario. The effects of these are not fully understood.

Due to the inherent dangers associated with fire, it is not possible to completely 'allow the forces of nature to function freely' (*Provincial Parks and Conservation Reserves Act 2006*). Active fire management is critical to ensure that every fire is managed in a manner that people, infrastructure and other values inside and outside of the park are not jeopardized, while maintaining and restoring fire

The purpose of this fire plan is to manage fire in Quetico Provincial Park (Quetico) in accordance with existing policies to achieve objectives set forth in the plan. The plan supports the role of fire on the landscape and directs how fires will be used (prescribed fire and prescribed burn) to maintain and restore ecological integrity, including the maintenance of a shifting mosaic of different successional and structural forest types. This will in turn support a diversity of flora and fauna that rely on these varying successional stages. In addition, the plan describes where and when full response will be applied to protect values, and when a modified and monitored response may be used to address resource management objectives while minimizing negative impacts.

Quetico Provincial Park (Quetico) has been actively managing fires for the last 10 years under the direction of the 1997 *Quetico Provincial Park Fire Management Plan*. This fire plan reflects new and revised provincial policy and guidelines, and new fire management direction for Quetico. The Quetico Fire Management Plan will provide fire management direction for Quetico Park from 2009-2019.

*Ecological integrity refers to a condition in which biotic and abiotic components of ecosystems and the composition and abundance of native species and biological communities are characteristic of their natural regions and rates of change and ecosystem processes are unimpeded (Provincial Parks and Conservation Reserves Act 2006, s. 5 (2)).*

## 2.0 Adaptive Management Framework

The reintroduction of fire into a landscape that has experienced fire exclusion policies for decades brings with it a high level of uncertainty. This uncertainty includes questions such as:

- How much fire is enough?



- What range of fire types are needed to maintain a healthy forest mosaic?
- What would the current fire regime be without active fire management and how can this be mimicked? Should this be mimicked?
- Is what is being managed for realistically achieved in a safe and effective manner?

The Quetico Forest Fire Management Plan uses an adaptive management framework to address this uncertainty. Adaptive management is a deliberate and informed process that links policy with science through learning by doing and changing practices accordingly. This adaptive management framework applies to the ecological goals within this plan.

The following schematic illustrates conceptually how the adaptive management framework will be implemented over the next ten years to ensure ecological goals and objectives are achieved and adapted to maintain currency.

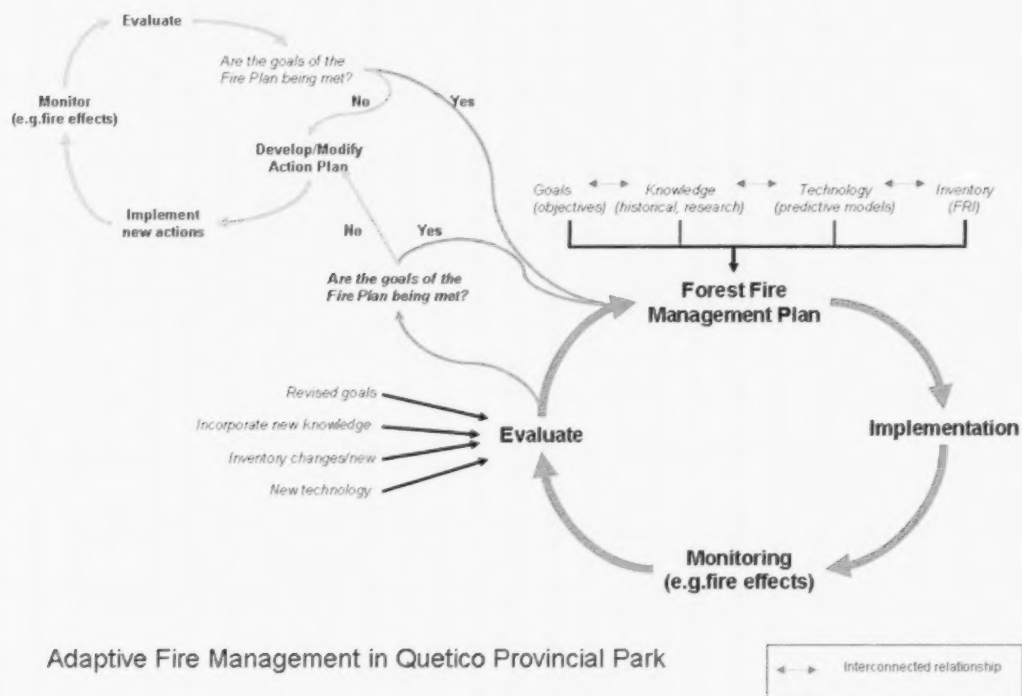


Figure 1 Adaptive Management in Quetico

The Quetico Forest Fire Management Plan begins the adaptive management cycle and is based on the best available knowledge and information containing broad goals and specific objectives to be achieved over the life of the plan. Implementation of this plan, the second phase, entails managing fire on the landscape within Quetico boundaries to meet the identified and measurable

objectives within the plan. Monitoring (phase three) involves the collection of data used to determine whether the objectives within the fire management plan have been met.

During the evaluation phase, data interpretation occurs. If the objectives within the plan are being met, the current fire management plan will continue to be implemented. If however, assessment of the data collected during monitoring indicates plan objectives are not being achieved under the current conditions, an action plan needs to be developed and implemented to ensure the goals and objectives of the plan are met. If the new action is meeting the objectives, the action continues and is monitored to ensure continued effectiveness. If however after evaluation the action is not meeting its purpose, the action plan may need to be modified once again. This cycle continues throughout the life of the fire management plan to ensure the intent of the plan is being achieved.

For example, if area burned benchmarks are not being realized prescribed burning is a tool that may be used in certain areas to maintain and or restore fire dependent ecosystem structure. Similarly, if prescribed fire prescriptions are not meeting the objectives for which they were developed these prescriptions may need to be refined and adapted. Methodology on how to achieve the objectives may need to be refined based on new direction, information, research etc..., and revised direction implemented with further monitoring and evaluation to ensure the revised objectives are being achieved.

### **3.0 Enabling Policy and Legislation**

#### **3.1 Provincial Parks & Conservation Reserves Act (2006)**

The *Provincial Parks & Conservation Reserves Act* (2006) provides legislative direction to all provincial parks and conservation reserves in Ontario. The importance of this act is that it provides the basis for promoting and maintaining ecological integrity and biodiversity within protected areas ecosystems and as such is a major influence in the creation of this fire management plan.

#### **3.2 Quetico Provincial Park Management Plan**

The direction in this fire management plan is currently consistent with the current *Quetico Park Revised Park Policy* (1995) and will meet the intent of the new *Quetico Park Management Plan* (draft).

The management direction for Quetico provides the broad management objectives and direction within the park boundaries. This park management plan supports fire management as a viable management tool to meet park management objectives.

#### **3.3 Forest Fire Management Strategy for Ontario**

This strategy provides strategic direction for the management of forest fires across Ontario. The Ministry of Natural Resource's (MNR) Aviation and Forest

Fire Management (AFFM) Branch implements the direction outlined in this strategy which supports the policy objectives of AFFM:

- to prevent personal injury, value loss and social disruption resulting from a forest fire; and
- to promote the understanding of the ecological role of fire and utilize its beneficial effects in resource management.

The *Forest Fire Management Strategy for Ontario* (2004), outlines which provincial parks are included within the Park Fire Management Zone. Quetico Provincial Park is included in this list. This zone was created to recognize the fact that fire is an essential ecological process fundamental to ecosystem health and sustainability. Other parks that are part of this zone will also be required to develop fire management plans.

### **3.4 Fire Management Policy for Provincial Parks and Conservation Reserves (FM: 2:12)**

This policy provides direction for fire management in provincial parks and conservation reserves. FM: 2:12 recognizes fire as an essential natural process, fundamental to restoring and maintaining the ecological integrity of Ontario's natural heritage and enables the safe and effective management of fire within protected areas.

### **3.5 Minnesota / Ontario Operating Guideline for Wildfire (2009)**

The *Minnesota/Ontario Operating Guideline for Wildfire* (2009) provides management direction on the management of fire preparedness, fire response and fire suppression in areas adjacent to the international border.

An agreement under this operating guideline is the *Protocol for Wildland Fire Use Management* between the Province of Ontario and the Superior National Forest. In order to promote the ecological benefit of fire, these agencies have implemented a similar approach to fire management within Quetico and the Boundary Waters Canoe Area Wilderness (BWCAW). This protocol, developed to facilitate fires crossing the international boundary between Quetico Provincial Park and the Superior National Forest, is updated annually and is used to assist agencies in attaining common resource management objectives.

## **4.0 Study Area**

### **4.1 Location and Administration**

Quetico is located approximately 160 kilometres west of Thunder Bay and 140 kilometres east of Fort Frances. The northern boundary of the park is only 10 kilometres south of the Town of Atikokan where the park headquarters is located. Quetico is located within the Ontario Parks Northwest Zone and the Ministry of Natural Resources Fort Frances District. Quetico lies within the boundaries of the West Fire Region in the province of Ontario (Appendix A). The administration of

Quetico is the responsibility of the Park Superintendent, with broad direction being received from the Ontario Parks Northwest Zone Office.

Ontario Parks has administrative and management responsibility for Quetico however, Fort Frances Fire Management Headquarters is responsible for and coordinates fire management activities within Quetico. Ongoing dialogue and cooperation between Quetico and Fort Frances Fire Management Headquarters staff has resulted in effective management of fire within Quetico Provincial Park since 1997.

#### **4.2 Size and Configuration**

Quetico is a wilderness class park with an area of approximately 475,800ha. It is of sufficient size to enable the ecological role of fire as an agent of natural disturbance to maintain ecosystems within Quetico (*Forest Fire Management Strategy for Ontario*, 2004). The park is well connected with other protected areas in the United States along its southern boundary, including Boundary Waters Canoe Area Wilderness (BWCAW) at 444,300ha within the Superior National Forest, and Voyageurs National Park (88,200ha). Collectively, these protected areas represent a contiguous protected area of 1,002,000ha which allows for increased opportunities to promote fire on the landscape.

Quetico has a large core protected area and minimal outer edge when compared to other protected areas such as the BWCAW. Despite the two protected areas having a similar landmass, the BWCAW has an edge to interior ratio that is approximately twice as high. Quetico maintains 418 km of perimeter edge, compared to the BWCAW, which has 943 km of perimeter edge. A greater core area allows for more effective ecosystem renewal through the use of tools that emulate natural disturbance. A larger core area also results in a lesser impact on adjacent values.

#### **4.3 Park Zoning**

Quetico is divided into two zone types to accommodate different management strategies based upon natural and cultural features, existing and potential recreation activities, existing development, and site conditions. These areas include two wilderness zones and five peripheral access zones (Appendix B). The wilderness zones encompass all but approximately 250ha (<0.5%) of Quetico's land base. The five access zones are distributed along the perimeter of Quetico.

#### **4.4 Land uses**

Multiple land uses exist within and adjacent to Quetico. The predominant land uses are outlined below and illustrated in both Appendix B and Appendix C.

##### **Within Quetico:**

- Canoeing
- Hiking

- Skiing
- Snowshoeing
- Fishing
- Car camping (Dawson Trail Campgrounds)
- First Nation traditional activities
- Motorized guiding by Lac La Croix Guides Association (LLCGA)
- Commercial native and non-native trapping

#### **Adjacent to Quetico:**

- Four Forest Management Units abut Quetico on the north, east and west sides; Crossroute, Sapawe, Dog-Matawin, Lakehead Forests
- Protected wilderness area on southern boundary of park in Minnesota (BWCAW)
- Tourism facilities
- Fishing and hunting
- First Nation traditional activities
- Commercial resource extraction (baitfish harvesting, trapping, forestry, mining)
- Lac La Croix First Nation
- Highway 11 corridor
- Seasonal and permanent residences

## **5.0 Environment**

### **5.1 Ecoregion and Ecodistrict**

Ecoregions are delineated primarily on broad scale climatic parameters. These include precipitation, temperature, and humidity. Ecodistricts are located within ecoregions, and are defined based on bedrock and surficial geological features in addition to local climatic patterns (Crins 2000).

Quetico Provincial Park is situated within the Quetico Section of the Great Lakes-St. Lawrence Forest Region. This region borders the Boreal Forest Region to the north. Quetico is located within the Pigeon River Ecoregion (4W) and entirely within the Quetico Ecodistrict (4W-1) (Appendix D). This ecoregion is contiguous with the Northern Superior Uplands Section in Minnesota's classification system. The total size of Ecodistrict 4W-1 is 1,666,700 ha.

### **5.2 Climate, Weather Patterns and Lightning Activity**

Quetico experiences a modified continental climate consisting of cold dry winters and short warm summers. Due to its location in the northwestern part of the province, Quetico is influenced by the Polar Continental air masses and also by the warmer Continental air masses originating in the foothill and prairie regions to the west. The drier prairie air masses have their greatest influence in the summer resulting in less precipitation than surrounding ecodistricts, which results in drier fuel conditions and the potential for increased fire intensity within the ecodistrict (Crins 2000).



The closest Environment Canada weather station to Quetico Provincial Park is located approximately 10 km from the northern boundary of Quetico, within the town of Atikokan. Based on data collected by Environment Canada from 1971-2000, the average annual temperature for Atikokan is 1.6°C and the average annual precipitation (snow and rain) is 739.6mm. The average temperature in July is 17.7°C and the average rainfall is 568 mm (Environment Canada, 2000).

Lightning is the primary ignition source for forest fires within Quetico boundaries. Historical fire data indicates that the occurrence of lightning-caused fires in Quetico ranged from zero fires to 45 fires annually between 1930 and 1999, with an annual average of ten fires. Records indicate that an average of seven fires occurred annually as a result of human activity during the same period.

Throughout the fire season (April 1-October 31), the prevailing wind direction is out of the south to southwest. This influences direction and rate of fire spread within the park and is an important consideration when assessing fire impacts.

Provincially, climate change predictions for the next century indicate that temperatures are increasing. Forest fire occurrences are beginning earlier in the season and are associated with increasingly variable conditions. Future climate scenarios suggest conditions conducive to increasing fire activity and area burned across most of the West Fire Region (Crofts & McAlpine, 2004). Specifically in the Atikokan area, the last 20 years have seen an overall decrease in snow accumulation accompanied by an overall increase in temperature of 0.5°C. Further study is required to determine a trend in changes to the amount of summer precipitation (Jackson, 2007).

### **5.3 Landforms and topography**

Quetico lies on the south-western portion of the Canadian Precambrian Shield. Although the majority of the park (northern portion) consists of altered sedimentary rock, the oldest rock formations that can be found in Quetico are predominantly metamorphic.

Low and rolling topography associated with shallow soil depths (less than 1 metre) cover most of Quetico's land area. Deeper soils are located in the northern section of Quetico and shallower soils located towards the southern section. Soil depth influences vegetation complexity and fuel type which in turn influences fire behaviour intensity and severity of fires.

Quetico's landscape is broken up by an abundance of lakes and rivers, many of which provide natural boundaries to fire spread. Although topography is not considered a significant contributor to fire spread over large distances throughout the park, it will increase fire spread on short, uphill runs. On south-facing slopes this effect is accelerated as a result of fuels drying more rapidly from increased exposure to the sun.

## **6.0 Interaction of fire with the land base**

Fire is an ecologically significant ecosystem process in the Great Lakes-St. Lawrence Forest Region however; human activity has played an integral role in fire disturbance patterns. Considering the similar forest types and the close proximity to Quetico, studies conducted in the BWCAW are used to demonstrate the influence of human activity on fire occurrence. Heinselman (1996) describes distinct cultural periods that can be used to illustrate variations in the fire regime. These periods are as follows: the Pre-settlement (prior to 1868); Settlement Period (1868 – 1910); and Suppression Period (1911 – 1972).

The transition from the Settlement Period to the Suppression Period revealed a drastic shift in societal perceptions of fire. During the Settlement Period, there was a marked increase in fires as a result of increased human activity. As this period neared its end, fire became viewed as a potentially devastating phenomenon. By the early 1900's, efforts were made to eliminate fire from the landscape entirely.

In the late 1800's, aboriginal populations intentionally burned jack pine forests to promote blueberry production throughout the BWCAW (Heinselman, 1973) however; there is little evidence to support the use of fire for other purposes among these populations. Although it is uncertain if similar practices occurred in Quetico, the presence of aboriginal populations and proximity to BWCAW suggests that intentional burning for similar results is possible.

Due to the wilderness management goals of Quetico, human activity is now limited to non-mechanized recreational activity, with few exceptions. The majority of human-caused fires that occur within Quetico are the result of shore-lunch fires and campfires left unattended or improperly extinguished. Although the occurrence of human-caused fires tend to peak in the spring and fall, human-caused fires may be a concern throughout the entire fire season if weather and fuel conditions are suitable for burning. From 1960 to 2007, 37% of all fires in Quetico were caused by human activity.

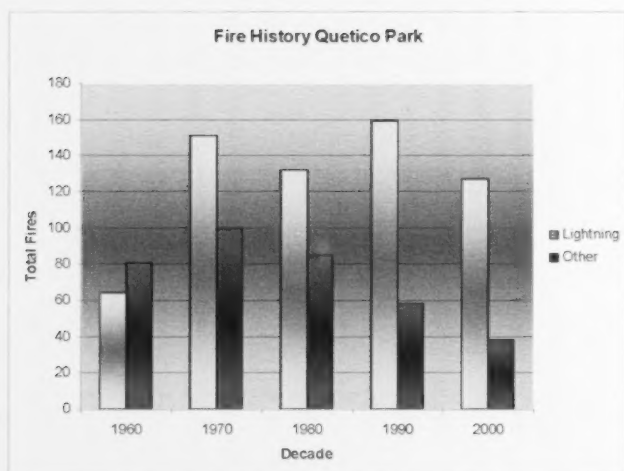


Figure 2: Fire history by ignition type

### 6.1 Natural & Recent Fire Regimes

Fire regimes are often described in terms of frequency, cycle, magnitude, type, spatial extent and seasonality. The frequency or fire return interval identifies the average number of years between two successive fire occurrences, whereas the fire cycle refers to the time required to burn an area equivalent to the area of interest (VanSleeuwen, 2006). Magnitude is expressed in terms of fire intensity and severity, both of which have a considerable influence on the effects of fire. The type of fire is expressed in terms of ground (sub-surface), surface, and crown. The spatial extent examines size and shape of fires and seasonality considers the time of year in which fires occur.

An understanding of the historical fire regime is necessary to restore and maintain fire dependant ecosystems. Studies conducted by Woods and Day provide insight into the historical role which fire played in Quetico. Findings from work conducted by Heinselman and Swain in the BWCAW are also applicable to Quetico and are summarized below.

At the landscape scale Quetico's natural fire regime was generally characterized by large, stand replacing fires. Large stand replacing fires play an important role in creating future tracts of mature interior forest. In addition to this they contribute to both the loss and creation of coarse woody debris in the park which has important structural features and provides nurse logs; an influence soil transportation; erosion and retention and is important in nutrient cycling. Large stand replacing fires contribute and are important to the vegetation mosaic that is currently observed in Quetico and are important in maintaining a healthy vegetation mosaic in the future.

Some areas within Quetico are characterized by a variable fire regime with low-intensity surface fires at short intervals combined with higher intensity fires at longer intervals, particularly in red and white pine stands. Prior to the 1900's,



lightning was the primary ignition source for forest fires within Quetico. During the settlement period, human activity such as logging, mining and other activities resulted in the increased fires occurrences (Woods & Day, 1977).

Prior to settlement in the mid-1800's, significant fire years occurred approximately every four years in the BWCAW, immediately south of Quetico (Heinselman, 1973). The frequency of these fires doubled from the mid-1800's to the early 1900's. Similarly, a fire ecology study conducted by Woods and Day (1977) revealed that most of the forest within the Hunter Island area of Quetico (Appendix E) originated from fires that occurred from 1868-1920.

As fire suppression activities were introduced and suppression techniques evolved throughout Ontario, the total area burned by forest fires in Quetico declined significantly. Woods and Day (1977) illustrate this shift within the 93,000 hectare (ha) study area in the park. From 1860 – 1919, the mean fire interval was 78 years with an average area burned of 11,735 ha every 10 years. During this period, 75% of the study area burned. From 1920 to 1939, the mean fire interval increased to 113 years. As fire suppression techniques further evolved, the mean fire interval increased dramatically to 870 years for the period from 1940 to 1976, with only 970 ha burning every 10 years.

Since 1920, approximately 120,000 hectares of Quetico's land base has burned. Of this area, 90,000 ha were the result of large wildfires that occurred in 1936 and 1995. With the introduction and subsequent developments in fire suppression activities, the fire cycle has increased from 50 – 80 years in some major vegetation types, to greater than 300 years. For the period 1976 to 1998, the fire cycle was 379 years (Frech, Caputo, & McCulloch, 1999). This number would be far greater had it not been for a large fire in 1995 that burned almost 25,000 ha in the southeast portion of Quetico.

In the 1977 Fire Ecology Study of Quetico Provincial Park, Woods and Day provide a map that displays Quetico's fire history throughout four distinct periods within the park defined by the following time periods: Pre-suppression Early Period (prior to 1859); Pre-suppression Recent Period (1860 – 1919); Suppression Early Period (1920 – 1939), and; Suppression Recent Period (1940 – 1976).

Figures 3 illustrates the number of fire occurrences and the area burned each decade during the suppression era (1930 – 2008). Prior to improved suppression efforts (e.g. 1930's vs 1960's to current), the number of hectares burned was significantly greater (49,276 ha) than the average during the suppression recent period (5130 ha (avg)) resulting in an increased fire cycle for the park.

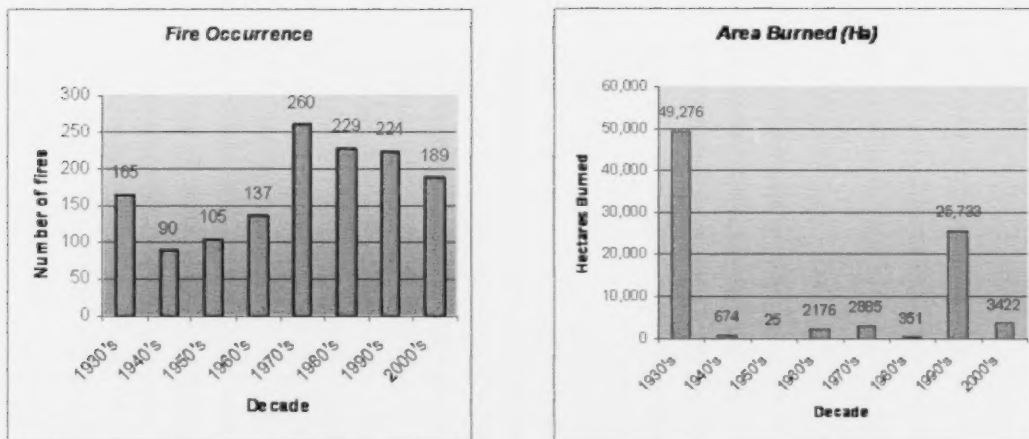


Figure 3: Fire occurrence and area burned by decade.

An increased fire cycle as a result of suppression activities is supported through work completed in the BWCAW in the early 1970s. During the Pre-settlement Period, Heinzelman (1973) calculated the fire cycle in the BWCAW to be 122 years. With the increased use of fire throughout the Settlement Period, the fire cycle decreased to approximately 87 years. Despite a relatively short historical fire cycle, some areas would have burned more than once, whereas other areas would experience longer fire return intervals, sometimes as high as hundreds of years. The shift in attitudes towards fire is evident when examining the transition from Settlement to the Suppression Period; a period where fire was perceived as an undesirable event with potentially devastating results. Following the introduction of fire suppression in the early 1900's, the fire cycle in the BWCAW increased dramatically to as high as 2000 years between 1911 and 1972.

Charcoal and pollen analyses conducted in the early seventies indicate that fire has played an important role in determining forest vegetation in the BWCAW for thousands of years. Swain (1973) determined that the vegetation in the vicinity of Lake of the Clouds has remained relatively stable for the past 1,000 years and that the frequency of fires throughout this period was approximately 70 – 80 years. He concluded that fire exclusion could impact vegetation composition, resulting in a shift towards an increased presence of shade tolerant species such as spruce, balsam and cedar.

The results of Swain (1973) are consistent with what has been observed within Quetico. Studies conducted by Woods and Day, and observations made by park and fire personnel indicate that older complex stands and the development of fire-sensitive, shade tolerant species (e.g. balsam fir) are becoming more dominant within the sub-canopy. This shift in forest age-classes (e.g. variable age class to older senescent age class) has had a considerable effect on

diversity and overall forest health within this fire dependent ecosystem, while increasing susceptibility of stands to natural disturbances including wind events, insect infestation, disease, and even fire (VanSleeuwen, 2006).

Table 1 summarizes a recent historical record of the occurrence of large fires (e.g. fires greater than 200 ha) for the period of 1960 to 2008. Historical fire records prior to 1960 are not exact; therefore, they have not been included in this table. Appendix E illustrates the spatial extent of all fires within Quetico from the 1920's to 2008 by decade. Prior to 1920's spatial records for fires within the park are scarce.

**Table 1: Large Fire Summary from 1961 to 2006**

<b>Year</b>	<b>Fire Size (ha)</b>	<b>Location</b>
1961	1,862	Blackstone Lake – southeast portion of park (Wildfire)
1972	356	Littlerock Lake – southeast portion of park (Wildfire)
1972	474	Camel Lake (Wildfire)
1972	652	Poobah Lake (Wildfire)
1974	943	Bell Lake (Wildfire)
1987	250	Camel Lake (Wildfire)
1995	25,085	McKenzie Lake (Wildfire)
1995	598	Pickereel Lake (Wildfire)
1996	1,780	Sturgeon Lake (Wildfire)
2000	1,000	Emerald Lake (Prescribed Burn)
2001	500	North Bay, Basswood Lake (Prescribed Burn)
2005	213	Agnes Lake (Prescribed Fire)
2005	430	Brent Lake (Prescribed Fire)
2006	238	This Man Lake (Managed Fire)
2006	264	Agnes Lake (Managed Fire)
2006	478	Shan Walshe Lake (Managed Fire)
2006	909	Kahshahpiwi Lake (Managed Fire)
<b>Total area burned</b>	<b>36,032</b>	

## 6.2 Fuels Assessment

Forest species such as jack pine and black spruce are most commonly found in mixed-wood communities within the park. Either species may be found dominant in the over-story with trembling aspen and white birch common in the understory. Jack pine and black spruce trees act as the primary fire carriers in this fuel type and are very receptive to ignition. Balsam fir is becoming increasingly common as a sub-canopy and understory species that provide a continuous fuel layer between the ground and the canopy. This has the potential for increasing rates of spread and fire intensity.

The second most common forest community within Quetico consists of trembling aspen and white birch overstory, with balsam fir and various shrub species in the

understory. These fuels are generally associated with less intense, slower moving fires.

Red and white pine forest communities are scattered and cover approximately 8% of Quetico's land base. In the absence of fire, the composition of understory is changing (e.g. increase in balsam fir) resulting in increased fire intensity that has the potential to increase red and white pine mortality.

Quetico currently supports a predominance of senescent forests which are highly susceptible to natural disturbances. Disturbances such as blowdown, insect infestations and disease are all factors that impact the overall condition of the forest. Although these events occur as a natural process, the outcome of each is largely influenced by the presence or absence of fire on the landscape. Major wind events (e.g. 1999 wind storm, 11,000 ha), have the potential to significantly increase fuel loading as a result of trees that are broken off or blown over completely. Where mortality occurs, insect infestation and disease may have a similar effect as trees die and eventually fall over. Increased fuel availability, may result in fires burning with greater intensity and severity. In particular jack pine budworm and spruce budworm (impacts both spruce and fir species) outbreaks have the greatest impact on fuel conditions that affect fire behaviour.

The last Forest Resource Inventory (FRI) that was conducted in Quetico Park occurred in 1968. Fuel characteristics have changed over time and are influenced by tree age, tree species, winds, insect and disease. The current inventory does not accurately reflect the forests of Quetico; however a new FRI is being undertaken and is expected to be available in winter 2009. The 2009 FRI is an essential tool to be used prior to, during and post fire events to ensure objectives of the plan are being met. In addition to this, the 2009 FRI will be incorporated within fire models to assist park and fire managers in determining the simulated natural variation for the park.

### **6.3 Fire Ecology and Effects**

Jack pine, black spruce, red pine, white pine, trembling aspen and white birch are commonly found within Quetico. The abundance of each species within the Quetico ecosystem is influenced by their fire disturbance history of the park. Fire effects vary significantly within and between fires. Vegetation responses to fire and post-fire succession are influenced by the characteristics of the fire including fire behaviour, intensity and duration, the pattern of fuel consumption and the amount of subsurface heating (VanSleuwen, 2006). Plant susceptibility to fire and the mechanisms by which plants recover also contribute to the abundance of the species post-fire.

Jack pine is a fire-dependant species due to its rapid growth, early reproductive maturity and the serotinous nature of cones which require temperatures of 49°C to 60°C in order to release seeds. As a result of these adaptations, jack pine will propagate even where mortality occurs following a high intensity fire.



Regeneration may also be greater following summer fires due to more duff removal and greater mineral soil exposure (VanSleeuwen, 2006). Although jack pine is the least shade tolerant pine species, it grows rapidly and quickly extends beyond herbaceous growth.

Fire behaviour in immature jack pine stands will differ from mature jack pine stands due to variations in fuel characteristics. Immature stands are dense and have a greater concentration of vertical fuels required to promote crown fire development. Even fires exhibiting low to moderate spread rates have the potential to develop into sustained crown fires in these fuels. Mature jack pine has a higher crown base height and lacks the vertical fuel layer that is present in immature stands. As such, mature jack pine requires a higher intensity surface fire in order to support sustained crown fires.

Black spruce is also a fire dependent species that requires fire to create suitable seed-beds needed for species regeneration. Low and moderate intensity fires often kill black spruce trees due to thin bark and shallow root systems. High intensity fires will result in extensive mortality. Seeds are released from semi-serotinous cones located in the tops of the trees where they are less likely to burn. An abundance of seeds are released immediately following fire, and continue to disperse at a lesser degree in subsequent years. Seeds may take several years to germinate.

Trembling aspen is capable of reproducing following low to moderate intensity fires. Thin bark makes these trees susceptible to fire however root systems sprout quickly and abundantly, making them highly competitive. Although trembling aspen often becomes the dominant species following fire disturbance, a deep burning summer fire may be sufficient to kill roots and suckers, preventing further regeneration. Aspen stands tend to be less flammable than conifer stands and often act as a natural fire break, reducing or eliminating fire spread. The exception is during the spring prior to green-up or when drought conditions are present.

Although highly susceptible to fire, white birch is well adapted and re-establishes quickly following fire. Trees that are damaged or killed by fire re-sprout quickly, especially following low intensity fires early in the season. Seeds are dispersed easily by wind and germinate in seedbeds established from the passing fire. Despite the nature of its bark, white birch is generally less flammable than conifer stands due to the lush canopy and herbaceous undergrowth. Similar to aspen, birch stands may burn readily in the spring or during extreme drought (Burns & Honkala, 1990).

Red pine and white pine are fire tolerant species due to the branch-free boles and thick bark. Fire produces a suitable seedbed and eliminates competition which is critical for regeneration. These species are resistant to low intensity fires however due to a low crown base height, young trees are highly susceptible to

the moderate intensity fires that are necessary in establishing a suitable seedbed. White pine can sustain a higher degree of crown scorch when compared to red pine, but is vulnerable to root damage caused by deep burning fires. White pine has a higher shade tolerance than red pine or jack pine, and will germinate on heavy litter found on the forest floor although mineral soil is preferred. As red pine trees mature self-pruning occurs, eliminating ladder fuels and making these trees more resistant to fire. Although occurrences are rare, crown fires will kill red pine, as will high intensity surface fires that result in significant crown scorch. Good seed crops are infrequent therefore regeneration may not take place until several years after a fire.

Balsam fir is not a fire dependant species. Branches extend from the surface to the crowns, providing a continuous fuel layer that promotes the development of crown fires. Balsam fir also has a thin, resinous bark layer, making it highly flammable. Because of its intolerance to fire, balsam fir often takes decades to re-establish unless a seed source is available from an unburned site. If seed is available, balsam fir will establish quickly on burned sites. Balsam fir is shade tolerant that is well-suited in the understory of stands.

Conifer, deciduous and mixed lowland species are generally not fire dependent species and have adapted other methodologies for reproducing in the absence of fire. Most fires that occur in lowland areas that contain wetland organic soils generally occur in late summer (e.g. August, September) during severe drought years when the water table has been lowered and moss layers become dried out. Under these conditions, given sufficient wind, trees (e.g. spruce, cedar) can carry major crown fires. Generally, lowland areas are spared during large fire events because of their location in convex depressions and become an important seed source for adjacent uplands.

#### **6.4 Fire Management History**

Forest fire management in Ontario has greatly influenced the Quetico ecosystem. Fire management in the province began in the 1920's with the advent of organized fire suppression. By the 1940's modern fire suppression reduced the number of large fires from Quetico. Since this time, the natural role of fire in Quetico's forest ecosystems has decreased.

Under the previous Forest Fire Management Strategy for Ontario (1988), and prior to the development of the Quetico Provincial Park Fire Management Plan (1997), Quetico fell within the Measured Fire Protection Zone. Within this zone, fires generally received an aggressive initial attack unless resources were unavailable due to resource requirement in the surrounding Intensive Fire Protection Zone.

In the 1980's, awareness of the effects of long-term fire suppression and the ecological significance of fire were beginning to be realized. By the early 1990s, Quetico managers began to investigate options for a fire management program

within the park. By 1997, the first Quetico Provincial Park Fire Management Plan was approved and provided direction on how forest fires would be managed in an effort to reintroduce fire within Quetico and enable it to fulfill its ecological role.

Under the *Quetico Provincial Park Fire Management Plan* (1997), Quetico was divided into two distinct zones; the Measured Compartment and the Prescribed Natural Fire Compartment (PNF). The Prescribed Natural Fire Compartment was identified, comprising of approximately 63% of Quetico's land base. The boundary of this zone was based largely on geographic features that provided natural barriers to fire spread. The Measured Compartment provided a buffer between the PNF Compartment and values adjacent to Quetico. Fires in the Prescribed Natural Fire Compartment were candidates for a monitored or modified response based upon pre-identified criteria and the approved fire assessment report (FAR). If PNF criteria were not met, a full response was initiated. Fires occurring in the Measured Fire Compartment generally received a full response due to proximity to values outside of park boundaries. Although this approach provided opportunities to restore fire on the landscape, the objective was broad in nature and did not adequately address the types of fire required to meet specific vegetation management objectives.

In 2005, the scope of the fire plan was expanded to allow human-caused fires to be managed as prescribed fire, provided they occurred in areas pre-identified for renewal (e.g. insect infested stands, blowdown, decadent stands). As a result of this inclusion, the PNF Zone became the Prescribed Fire (PF) Compartment.

With the *Quetico Provincial Park Fire Management Plan* (1997) already in place, fire response remained largely unchanged with the implementation of the current *Forest Fire Management Strategy for Ontario* (2004). Other than minor changes in terminology, to provide consistency with this strategy, fire response within Quetico boundaries remained the same.

Historically, prescribed burning has been used to achieve hazard reduction objectives within Quetico. These objectives were specifically linked with the blowdown event that occurred in 1999. In 2000, a 1,100 ha prescribed burn was undertaken at Emerald Lake with the specific objective of reducing the blowdown hazard in this area. The following year, a prescribed burn was conducted at North Bay on Basswood Lake with a total of 400 hectares burned.

In 2003 a Prescribed Burn Plan for "The Pines" area was completed and approved to decrease the fire hazard associated with a 550 ha blowdown event that occurred at The Pines on Pickerel Lake that same year. To date, conditions have not been suitable to complete this project however in 2004 a 1.8ha burn was conducted using hand-ignition in the area immediately adjacent to the camp area at The Pines. This prescribed burn provided a buffer to eliminate the risk of fire spreading this high use area at the Pines into adjacent areas containing higher concentrations of blowdown.

Since 1998, approximately 4,032ha have burned within Quetico directly as a result of an active fire management program.



## 7.0 Values Potentially Impacted by Fire

Both forest fires and fire suppression activities have the potential to impact socio-cultural, economic and ecological values that are found within and adjacent to Quetico Provincial Park. The effects may be positive or negative depending on the values being impacted (Table 2 and Table 3).

**Table 2: Ecological impacts of fire occurrence versus suppression in Quetico**

	<b>Moving towards ecological integrity</b>	<b>Moving away from ecological integrity</b>
<b>Fire Occurrence</b>	Increase in habitat for wildlife species requiring regenerating forests (e.g. moose, lynx)	Severe fires may reduce the spatial occurrence of old-growth red and white pine stands in the short term
	Provide habitat for fire dependant wildlife species (e.g. black-backed woodpecker)	
	Allow fire dependant tree species to persist within Quetico (e.g. jack pine, red and white pine)	
	Low intensity fires have the potential to promote red & white pine in Quetico in the long term	
	Improve health of fire dependent ecosystems by removing dead and dying trees and providing suitable seed beds for desirable fire dependent species	
	Balances the natural insect infestation cycles within forest communities	
<b>Fire Suppression</b>		Long term fire exclusion may promote the reduction or loss of fire-dependant forest types (e.g red pine, jack pine, black spruce)
		Long term fire exclusion promotes succession to short lived species (e.g balsam fir, poplar species)
		Promote increase in forest fuel accumulation which will increase fire intensity and may negatively impact forest succession

**Table 3: Cultural and socioeconomic impacts of fire occurrence vs. suppression**

	<b>Positive</b>	<b>Negative</b>
<b>Fire Occurrence</b>	Charring of some types of artefacts can slow down the decomposition process.	Visitor management/distribution- the anticipated wilderness experience may be disrupted due to re-direction of visitors away from hazardous areas.
	Artefacts located on these sites will be more visible and the ability for those doing cultural research will be greatly increased.	Cultural heritage sites- heat alteration of sediments and/ or destruction of artefacts along with post-fire erosion of cultural sites and disruption of archaeological context (timelines/associations).
	Potential to attract new park visitors and researchers studying fire behaviour, ecology, and history.	Smoke impact to the communities of Lac La Croix, Atikokan, and various cottage subdivisions adjacent to Quetico.
	Opportunity exists to provide public education and interpretation on the ecological benefits of fire on the landscape	Closure zone, travel restrictions, and aesthetics have the potential to economically affect outfitters and other park users.
		Adjacent forestry values could potentially be impacted should fire escape Quetico boundaries.
	Heightened opportunity for wildlife viewing	
	Reduce long-term threat to public safety.	Visible artefacts may be removed by campers
<b>Fire Suppression</b>	Reduced short-term threat to public safety	Older decadent forests which result in an increase in fuel accumulation resulting in an increased risk to values and human safety
		Increased effects on park visitor's wilderness experience by way of increased aircraft presence, more intensive ecological footprint by firefighters

Protection measures for significant values potentially impacted by fire management activities will be addressed in the *Quetico Provincial Park Management Plan* (draft).

## **8.0 Fire Management Goals and Objectives**

**Goal: Prevent personal injury, value loss, economic, and social disruption**

Objectives:

- All fires and associated hazards will be assessed for level of risk using the criteria in the Quetico Park Fire Decision Key (*Quetico Fire Operations Plan* 2009)

- An approved Fire Assessment Report will be used for all managed for prescribed fires within Quetico
- Public safety tools such as closure zones, public notification and will be utilized to minimize impacts to park visitors, members of the public, and other stakeholders
- The 2009 *Quetico Fire Operations Plan* will include a communications section that clearly identifies communication messages and information sharing opportunities between MNR (AFFM and Ontario Parks) and external stakeholders and partners

**Goal: Explore opportunities to allow fire along the Quetico boundary**

**Objectives:**

- Refine research completed by Grant (2007) to develop a fire break along the north-eastern boundary of Quetico with new Forest Resource Inventory (FRI 2009) to enable the use of prescribed burns.
- Prepare proposal and meet with the four Sustainable Forest License (SFL) holders that abut the park to discuss opportunities for allowing fire along boundaries. Due to prevailing winds and age of the forest in the north-eastern section of the park, Quetico will meet with Sapawe Forest within two years of plan approval and within three years with the other three SFL holders.

**Goal: Work with first nations, stakeholders, visitors and partners to increase knowledge on the ecological role of fire and fire management in Quetico**

**Objectives:**

- Provide information regarding the safe use of fire.
- Provide informational brochures about the ecological role of fire in Quetico.
- Develop and implement community workshop(s) by 2010 with Lac La Croix First Nation to foster an understanding of the importance of fire management within Quetico and the potential impacts on the community.

**Goal: Fire management activities will be undertaken (whenever feasible) in a manner to minimize negative impacts within Quetico and the surrounding area**

**Objectives:**

- AFFM will endeavour to use "Light on the Land" minimal impact techniques whenever feasible. Where light on the land techniques can not be used, all efforts will be made to return the impacted areas to as natural a state as possible.
- AFFM staff will minimize the risk of spreading invasive aquatic species via water bombing activities by utilizing lakes with no known invasive species whenever possible. A map of known invaded lakes will be provided to AFFM staff before the beginning of each fire season.

**Goal: Monitor fire effects at different temporal and spatial scales to continually refine fire objectives in Quetico**

**Objectives:**

- Refine pre and post fire monitoring protocols by 2009 to assess vegetation diversity, community structure, regeneration and competition to determine if early successional and fire-dependant forest species and communities are perpetuated.
- Continue to use monitoring protocols to determine levels of fuel loading and amount of fuels reduction in fires where this objective has been defined.
- Determine wildlife monitoring needs and priorities for wildlife that are dependant on early successional forests and other fire dependant wildlife species. The needs assessment will be completed by 2011 and the development and or assessment of existing protocols will be completed by 2012.

**Goal: Maintain and restore fire dependant ecosystem structure, function and processes within Quetico to the maximum extent possible and conduct research where information gaps exist**

**Objectives:**

- Support research to understand what the current fire regime is in Quetico, including simulation modelling of fire regimes and forest succession, historical fire information and effects of climate change on fire regimes.
- To attain the historical fire cycle of 78 years as identified by Woods and Day (1977) for the pre-suppression period, an average area of 4,750 ha would be required to burn annually. As the occurrence and severity of fire events is highly variable, it may become difficult to achieve this annual average. As such, a 10 year rolling average will be used as a relative indicator for park and fire managers to assess the success of the intent of this plan in maintaining a more natural fire cycle and restoring fire within Quetico's fire dependant ecosystem .
- Uses prescribed fire and develop forest community prescriptions within fire dependant communities that have declined or are at risk of declining due to fire suppression to ensure regeneration and maintenance of these species.
- Develop a prescribed burn strategy by 2011 that identifies areas for renewal and hazard reduction.

**Goal: Promote Quetico as a centre for fire research**

**Objectives:**

- Continue and expand the development of partnerships with research institutions and government agencies.
- Provide support where possible to individual researchers to further fire and fire effects research within Quetico.
- *Ensure Quetico Provincial Park Research Strategy (Solomon 2007) is kept current and priorities for fire research are shared with researchers.*

**Goal: Fire research and management will be an important component of the Natural Heritage Education (NHE ) program**

**Objectives:**

- Educational programming and messaging regarding fire ecology will be developed in the *Natural Heritage Education Plan* (Draft). Key messages will include specific educational programs to be delivered in the campground, in the interior and within the primary and secondary schools in the Atikokan area.
- Develop interim fire management programming by the 2009 operating season. This will be used until the NHE Plan is finalized.

**Goal: Identify and maintain sensitive biological, cultural and historic sites**

**Objectives:**

- Continue inventories and mapping of sensitive flora and fauna, including species, community and critical habitat (Species on Schedule 1 of the Endangered Species Act, provincial and regionally rare species).
- Ensure that Fort Frances fire staff is provided with maps of sensitive flora and fauna locations and that maps are updated yearly.
- Develop fire effects database by 2011 for sensitive floral and faunal species to ensure these species are perpetuated.
- Fort Frances and Quetico staff will meet with Lac La Croix to ensure that the sensitive cultural and historical sites are properly mapped and to determine which sites could be negatively impacted by fire.
- Quetico staff will update historical sites inventory and prepare maps to identify which non-aboriginal historical sites in the park are considered sensitive and to what degree of protection from fire is necessary.

## **9.0 Fire Management Options**

A number of fire response and fire use options may be used by park and fire managers within Quetico to meet the goals and objectives of this fire management plan.

### **9.1 Fire Response**

Fire response is the observation, assessment, suppression or other influence of fire behaviour such that costs and/or damage are minimized and benefits are maximized.

Managed fire response includes using a combination full response, modified response, and monitoring of fires in order to balance the benefits associated with the ecological role of fire within the Quetico ecosystem with the need to protect human life and property.

#### Full Response

Full response of forest fires includes immediate, aggressive initial attack and/ or sustained suppression action until the fire is declared out. Total fire suppression



within Quetico is contrary to the wilderness park goals and objectives and does not realize the fire management strategy objective of promoting an understanding of the ecological role of fire and utilizing its beneficial effects in resource management. If public safety, property or other values are threatened within Quetico, a full response will be initiated.

#### Monitoring Response

A monitored fire response involves the observation and assessment of a fire to ensure this fire response option continues to address ecological or resource management objectives while ensuring social disruption and/ or significant values and resource impacts is minimized.

Monitoring has been a tool used by park and fire managers since the implementation of Quetico's first Fire Management Plan in 1997. This fire response option provides a viable opportunity to partially restore fire as an ecosystem process within Quetico's boundaries at a very broad scale.

#### Modified Response

This response opportunity uses a combination of suppression techniques including direct and indirect attack (e.g. burning out) as well as monitoring to steer and contain the fire within a predetermined perimeter. Modified response opportunities allow suppression action to be taken on key areas of the perimeter of a fire to minimize negative impacts while still achieving the desired objective for the fire.

Modified response is a valid opportunity to partially restore and maintain fire dependent ecosystems within Quetico and provides the opportunity to burn out to natural boundaries to meet fire management area burned and ecological objectives of Quetico. This response option also balances the ecological objectives for managing the fire while minimizing the negative impacts associated with allowing a fire to burn.

### **9.2 Fire Use**

Fire use is the strategy of maintaining fire as an ecological process or meeting resource management objectives through the application or management of fire.

Prescribed fire and prescribed burning provide park managers with the opportunity to reduce hazards such as excessive fuel accumulations within Quetico and promote ecosystem renewal objectives such as restore and/or maintain ecosystems (e.g. species regeneration), improve and/or develop wildlife habitat and balance insect and forest disease outbreaks.

### Prescribed Fire

Prescribed fire deliberately uses forest fires in a predetermined area in accordance with a pre-specified and approved burning prescription to achieve preset objectives.

Prescribed fire is also a potential fire use opportunity that would allow park and fire managers to deliberately use forest fires to realize specific ecological objectives within Quetico Park. This opportunity uses human (e.g. camp fire) and lightning caused fire occurrences in areas where a very specific outcome is wanted. Alone, this fire use option may limit the amount of fire needed within Quetico to maintain fire dependent ecosystems.

Prescribed fire would likely not be an option near or adjacent to the northern and western park boundaries due to the high concentration of values and infrastructure in the area. Whereas, on the eastern and southern boundaries of Quetico, infrastructure values are fewer in number, the impacts associated with fire are reduced and prescribed fire provides greater flexibility to realize specific ecological objectives identified in future planning.

### Prescribed Burning

Prescribed burning is the deliberate, planned and knowledgeable application of fire by authorized personnel to accomplish pre-determined forest management or other land use objectives within a specific area.

Prescribed burning is an option that will also provide Quetico staff the opportunity to maintain and enhance ecological integrity, and meet hazard reduction objectives within Quetico. This opportunity would be used in areas where monitoring or modified response or prescribed fires may not be feasible (e.g. near Quetico boundary, adjacent to structural or community values) or in areas where a very specific outcome is wanted.

Potential prescribed burn candidate areas will be identified by the Quetico Park Prescribed Burn Strategy as identified in the fire management goals and objectives.

## **10.0 Fire Management Approach and Implementation**

Fire management approaches include a combination of one or more of the fire response and/or fire use options described above. The goal of fire management approaches is to provide greater flexibility and opportunity to meet the fire management goals and objectives for Quetico while minimizing the negative impacts associated with forest fires.

A number of approaches were considered for this fire management plan. The *Quetico Provincial Park Statement of Fire Intent* (2008) outlines these approaches and provides the rationale to support or reject each approach.

Copies of the Quetico Park Statement of Fire Intent (2008) are available at the Quetico Park Office or Fort Frances Fire Management Headquarters.

### **10.1 Quetico Fire Management Approach**

Fire management in Quetico will employ a combination of fire response and fire use options by compartment to meet the identified fire management objectives for Quetico. The boundaries for each compartment are detailed in Appendix G. Projects will occur on a recurring basis between 2009 and 2019. Both human and lightning caused fires will be considered and managed using the appropriate fire response and fire use options described below.

The border between Compartment 1 and Compartment 2 is separated by geographic features containing natural fire breaks (eg. lakes, terrain) and are easily identifiable. Additionally, this boundary provides Compartment 2 with a suitable firebreak for mitigating fire spread outside this compartment which will minimize risk to human life, private property and adjacent land use values. This boundary has been utilized successfully since implementation of the 1997 Quetico Fire Management Plan. Two prescribed fire compartments (Compartment 3 and Compartment 4) have been also been developed to meet specific vegetation management needs of the park ecosystem.

### **10.2 Implementation**

Implementation of fire management within Quetico balances the need to maintain and restore the ecological integrity with the need to mitigate risks to public safety and other values within and adjacent to park boundaries.

The effects of fire are the same regardless of the fire cause; therefore some human caused fires may not be suppressed if they occur in areas designated for renewal identified during the initial fire assessment. Education and prevention messages will continue to discourage human caused fire starts. Regulation 207/96 under the *Forest Fires Prevention Act* is still applicable. Individuals deemed non-compliant with this Act, pending fire investigation, may be prosecuted. The Quetico Provincial Park Fire Operations Plan provides further direction where non-compliance occurs.

#### **10.2.1 Compartment Descriptions**

##### **Managed Fire Compartments**

###### **Compartment 1**

Compartment 1 is located along the northern boundary of the park. Rolling topography, broken by numerous lakes and rivers is commonly found throughout this compartment. This compartment is a mixed-wood forest dominated by jack pine, black spruce and trembling aspen. Fires that occur within this compartment have the potential to provide a net beneficial effect for these fire dependent forest communities.



Dawson Trail campground and entry station are located along the northern edge of the compartment, while the majority of recreational use within this compartment consists of canoeing and backcountry camping. Adjacent to the border includes the township of Atikokan to the north, low density cottage subdivisions, the highway 11 travel corridor and forest industry values.

A higher level of protection is required within this compartment to mitigate impacts to values in and adjacent to the Quetico boundary. Also within this compartment, there are a number of natural boundaries (eg. water bodies, terrain) that may be used during suppression activities to limit fire spread. Fires that occur in Compartment 1 have the potential to cause low to moderate social disruption to areas within Quetico. Park visitors may experience altered (redirection to other areas) travel plans with closure zones in effect when fires occur.

As such, a modified response as outlined in the *Fire Management Strategy for Ontario* may be followed within Compartment 1. Direct and indirect suppression activities, including burning out to natural boundaries may be used to steer or contain a fire within a predetermined area as per an approved FAR. All fires in this compartment will receive a response equal with values at risk and fire program capacity, such that costs and damage associated with forest fires will be minimized and any beneficial effects maximized. Any forest fire that has the potential to threaten human life, public safety, property or other values in and adjacent to Quetico Park will be declared a wildfire and will receive a full response and sustained action until extinguished. Sustained action, if required will be guided on an approved Fire Assessment Report. Structural protection, if needed will be in accordance with the *Structural Protection Guidelines*.

#### Compartment 2

Compartment 2 comprises approximately 63% of the Quetico Park land base. This compartment is located south of Compartment 1 and extends south to the international border, west to the community of Lac La Croix and southeast to the Thunder Bay District boundary. There are no campgrounds located within this compartment. Backcountry and canoeing is the primary use within this compartment with scattered campsites located throughout the area.

This compartment is a mixed-wood forest dominated by jack pine, black spruce and trembling aspen. Mature red and white pine trees are also prevalent along the southern border of this compartment. Fires that occur within this compartment have the potential to provide a net beneficial effect for these fire dependent forest communities.

Fires that occur in Compartment 2 have a limited potential to cause social disruption and/or negatively impact human values. Fires that occur in this compartment may have the potential to impact visitor use within Quetico; however, a visitor management strategy (including closure zones) has been developed and is implemented to restrict access to areas where fires are occurring.

As such, Compartment 2 will generally receive a monitored response based on an approved FAR. Fires will be monitored to ensure they do not threaten human life, public safety or currently identified values. If a fire threatens human life and/or property, a full response and/or modified response and values protection will be used until the threat has passed. Action will then revert to monitoring the fire.

In both Compartment 1 and Compartment 2, monitoring or the use of modified response will be in accordance with the *Guidelines for the use of Modified and Monitored Response during Managed Fire Operations*. Values protection, if needed, will be in accordance with the *Structural Values Protection Guidelines*.

### **Prescribed Fire Compartments**

Prescribed fire may meet specific ecosystem renewal and hazard reduction objectives necessary to maintain and improve the ecological integrity within Quetico. Two prescribed fire compartments have been identified. These compartments are nested within the boundaries of Compartment 2. Additional compartments may be identified as new research and information becomes available and will be included as part of this fire management plan.

There are no campgrounds located within these compartments. Backcountry and canoeing is the primary use within this compartment with scattered campsites located throughout the area. Fires that occur in Compartments 3 and 4 have a limited potential to cause social disruption and/or negatively impact human values. Fires that occur in these compartments may have the potential to impact visitor use within Quetico; however, a visitor management strategy (including closure zones) has been developed and is implemented to restrict access to areas where fires are occurring.

Fires that occur within these compartments have the potential to provide a net beneficial effect for fire dependent forest communities. Brief descriptions for these compartments are provided below, with specific prescriptions included in the Quetico Provincial Park Fire Operations Plan.

### **Compartment 3:**

Compartment 3 is located in the north-central part of Compartment 2 and consists of 9,223ha. The objective for this compartment is to address concerns regarding the lack of jack pine renewal within the park. Currently jack pine communities within Quetico are senescent and many areas of the park have

been impacted by jack pine budworm. A shift to black spruce, balsam fir and shade tolerant hardwoods will occur if jack pine regeneration does not occur through the use of fire. In order to accomplish this objective, a moderate to high intensity surface fire is needed to open serotinous cones and eliminate the deeper organic layers associated with this fuel type. Low intensity surface fires are not effective in the removal of the duff layer therefore will not be considered in this compartment

#### Compartment 4:

Compartment 4 consists of two areas in the south-western part of Compartment 2 and consists of 13,951ha. The objective for this compartment is to maintain old growth red and white pine communities within these areas while promoting new regeneration of these species. In order to accomplish this, a low to moderate intensity surface fire is needed to reduce the litter and duff layers, expose mineral soil and eliminate herbaceous growth and other competition species in the understory. With this type of fire, some mortality resulting from crown scorch is expected and will open the canopy to enable sunlight to reach the forest floor, supporting regeneration. High intensity surface fires may result in extensive crown scorch, root damage and significant mortality therefore, this type of fire will not be considered for the maintenance of red and white pine stands.

#### Prescribed Burning

Managed fire response and prescribed fire opportunities cannot always meet park objectives due to the random and spatial nature of lightning and some human caused fires. Therefore, prescribed burning may be needed to enable the Quetico fire management objectives to be met (e.g. wildlife, vegetation, old growth, hazard reduction etc.) in all compartments. Candidate areas will be identified within the Quetico Park Prescribed Burn Strategy in order to address park management objectives. Until this strategy is developed, areas within the park may be identified by park staff for ecological renewal and hazard reduction objectives.

#### **10.2.2 Border Fires**

Fires originating in Minnesota that have the potential to cross the international border into Quetico Park will be assessed in consultation with Quetico Park managers, Fort Frances Fire Management Headquarters and representatives from the US Forest Service. Fires will be managed using appropriate fire response and/or fire use criteria based on an approved Fire Assessment Report which will include the predicted fire behaviour, the potential impact of the fire on persons, property and values and the estimated cost of the response. The *Quetico Provincial Park Fire Operations Plan* provides communication linkages between the agencies involved.

Fires originating in Quetico Provincial Park that have the potential of crossing into the Boundary Waters Canoe Area Wilderness are subject to the same process as described above. The BWCAW will not accept human-caused forest fires therefore these fires need to be managed accordingly to reflect this policy

direction. Fires entering Quetico from BWCAW into prescribed fire compartment must meet the prescriptions assigned to these compartments to be accepted.

### **10.3 Fire Operations Plan**

The Quetico Fire Operations Plan provides internal detailed daily operational direction on the implementation of this fire management plan and is updated annually. The Fire Operations Plan defines the roles and responsibilities, by position, for MNR, Quetico and forest fire management staff. This plan provides detailed explanation as to how fire response and use will occur within each compartment identified in this plan.

### **10.4 Fire Assessment and Reporting**

#### **10.4.1 Fire Assessment**

The Aviation and Forest Fire Management Branch (AFFM) relies on a standard process for the completion of fire assessments in areas where different response options may be considered. The Fire Assessment Report (FAR) form is used to analyse and document conditions specific to each fire, and is used in determining the most appropriate fire response. Subsequent assessments will also consider whether the current approach remains appropriate in attaining public safety and resource management objectives. Where necessary, the need for alternative approaches will be identified and implemented.

The FAR form and the process for completing these assessments are included in the *Quetico Provincial Park Fire Operations Plan* and the *West Fire Region Fire Operations Plan (2004)*.

The Fire Assessment Report (Appendix H) is comprised of five sections:

*Part 1 - Data Collection*

*Part 2 - Impact Assessment*

*Part 3 - Response Options*

*Part 4 - Recommended Options*

*Part 5 - Approved Option*

Upon completion of the initial Fire Assessment Report, subsequent assessments will be documented using the *Quetico Provincial Park Subsequent Fire Monitoring Assessment* form. This form captures updated fire information and includes fire behaviour observations, updated fire size and perimeter, fire behaviour and growth predictions and additional values that may be impacted based on predicted fire growth. All assessment activities will be documented until the fire is declared out.

#### **10.4.2 Reporting**

The *Forest Fire Management Strategy for Ontario* identifies performance measures for fire response and area burned within the Parks Zone. Where a full response has not occurred, provincial targets have been established based on area burned and is divided into two categories; ecosystem renewal and hazard



reduction. Area burned within Quetico for the purpose of hazard reduction and/or ecological renewal are included in this target. This information is submitted annually by the Fort Frances Fire Management Headquarters to the Dryden Fire Management Centre for inclusion in the annual *Fire Strategy Performance Assessment Report*.

## **11.0 Relationship to Environmental Assessment**

The fire management options described in section 8.0 are components of the project called "undertake prescribed burning and manage forest fire" identified in the Class Environmental Assessment for Provincial Parks and Conservation Reserves. Monitored response, modified response and prescribed fire have been screened and determined to be category B projects because there is potential for low-moderate net negative environmental effects; however there is a high degree of certainty about what the effects will be. In addition, most effects can be mitigated. There is medium potential for aboriginal, public and agency concern. Full response and prescribed burning were screened to category A projects. Prescribed burns require detailed planning in accordance with the Prescribed Burn Operations Policy (2008) and Prescribed Burn Planning Manual. Full response and sustained action (based on an approved FAR) is planned for and processes are in place to ensure the protection of people property and other values occurs seamlessly. As a result there is potential for low net negative environmental effects. However there is a high degree of certainty about what those effects will be and they can be mitigated.

## **12.0 Mitigation**

To minimize adverse impacts associated with forest fires, every fire in Quetico will receive a response governed by compartment, predicted fire behaviour, potential impact, program capacity and estimated cost. All fires that do not meet the criteria in the Quetico Fire Management Response Decision Key (The Decision Key) will be classified as wildfires and will receive a prompt, safe and cost effective action, based on Aviation and Forest Fire Management standard operating procedures. Section 12.1 provides explanation as to what the decision key is and how it is used. The most appropriate fire response will be determined through consultation between fire, and park managers as part of the fire assessment report process.

### **12.1 Risk Assessment**

When a fire occurs, a number of factors are assessed to determine whether the risk associated with allowing a fire to burn is within an acceptable range. Criteria used during the risk assessment includes impact to: visitor and staff safety; structural values; habitat; adjacent values; smoke impacts; weather and fire behaviour within acceptable parameters; areas identified for renewal; provincial and regional fire situation; park resource capacity; the fire's proximity to the park boundary; and cumulative risk factors. A daily analysis and situation report is completed for any ongoing fires within Quetico and considers the above criteria.

The Decision Key uses a series of yes/no questions to assist fire and park managers in decision making associated with fire management plan implementation. This tool is used to support the recommended option identified in the Fire Assessment Report for the fire and may be found in the Quetico Provincial Park Fire Operations Plan.

Risk assessment is ongoing throughout the duration of all fires; ensuring adaptive management occurs and addresses new impacts as they arise.

## **12.2 Human Health and Safety**

Ensuring the health and safety of park visitors and people in areas adjacent to Quetico is the top priority for managing all fires in the park. Where deemed necessary, park visitors may be exposed to a progression of visitor management activities as the complexity of the fire situation or level of fire activity increases. Standard messaging about fire safety, fire prevention and fire management is provided in advance to all visitors with a confirmed reservation. Current fire condition information, including the fire hazard, location and size of active fires in the park is provided at the entry stations. As the fire situation escalates, direct contact with visitors in the interior occurs. Fire information is also provided on the AFFM extranet site and on the Quetico Park Information Hotline to allow all stakeholders access to timely information regarding fire status and other pertinent updates.

Under the *Provincial Parks and Conservation Reserves Act* (2006), the park superintendent may restrict use or close specific areas within the park to travel if a fire is deemed to threaten public safety. This will occur in consultation with fire management staff and the Ontario Parks NW Zone Manager.

When closures or evacuations are required, specific plans are developed for each circumstance. Closure zones have been pre-identified based on travel patterns and are used to aid in the development and implementation of closure plans. *The Quetico Provincial Park Emergency Response Plan* provides direction on the planning and implementation of evacuations that occur within the park. Intended travel routes and length of stay are identified by park visitors prior to entry, enabling staff to track the concentration and distribution of park users throughout Quetico at any particular time.

During fire assessments, the effect of smoke on areas within and adjacent to the park is considered and includes local residents, highway and road corridors, air operators, communities and businesses. Communications with stakeholders occur through a variety of methods dependant on the audience, proximity to active fire(s) and the degree of impact anticipated.

The *Quetico Provincial Park Fire Operations Plan* provides additional information pertaining to the roles and responsibilities of park and fire personnel, and the



messages and methods of delivery throughout various degrees of fire escalation and evacuations.

### **12.3 Minimum Impact Suppression Techniques**

Aviation and Forest Fire Management Branch will endeavour to use minimal impact suppression techniques whenever possible. These "Light on the Land" techniques do not unduly disturb the landscape and will include, where feasible:

- Utilization of natural clearings for helipads, base and line camps and support installations
- Locating support facilities away from recreational areas and main travel routes
- Minimizing the use of chemical fire retardants and foams unless it is deemed essential in the protection of human life and property
- Utilization of hose lines instead of mechanically constructed fire breaks
- Minimize tree felling, unnecessary noise
- Remove all garbage and constructed objects
- Safe fuel handling and disposal

An annual review occurs for all fires which includes consideration of mitigation practices and revises these accordingly.

### **13.0 Fire Effects Monitoring**

Fire effects monitoring will be conducted as per program capacity to determine the degree of success of managed fire, prescribed fire and burns in meeting park objectives. Partnership opportunities between the academic community, Quetico Foundation, AFFM, and Ontario Parks will be encouraged and promoted to facilitate monitoring within Quetico.

In managed fire areas, post burn monitoring (within one fire season of initial burn) will include the following data: year in which the fire occurred; area burned; fuel type; fire intensity; fire weather indices; duration of fire; description and location of any suppression activity that occurred, and; regeneration observed on site accompanied by photographs.

In prescribed fire areas, additional information will be collected and pre and post fire effects monitoring will occur. Fixed long term monitoring plots will be established and information collected will capture information on mortality, competition, fuel loading, vegetation diversity, canopy cover, density, age and height of trees and soil type.

Landscape level monitoring will also occur prior to plan review. A number of data sources may be utilized to determine fire regime and range of variability.

Fire modelling (e.g. BFOLD's, Landis) is a tool that may be used to assist park and fire managers in adapting their management of fire within the park. Specifically modelling may help determine whether the area burned benchmark is being met sufficiently; whether these area burned objectives are within the

natural range of variation and if these objectives need to be adapted (e.g. adapt area burned benchmark) or additional measures need to be undertaken to reach the objective (e.g. compartments 3 or 4 undertake prescribed burn if under achieving or suppression in certain areas if over achieving).

A standardized post-burn monitoring protocol is included in the Quetico Fire Operations Plan.

## **14.0 Communications**

### **14.1 General Communications**

A detailed communication section is provided within the Quetico Provincial Park Fire Operations Plan. This section provides information regarding how communications with these key audiences will be addressed during normal and escalated fire situations as well as prior to and during the fire season. The Quetico Provincial Park Fire Operations Plan will also outline specific methods for delivering fire ecology and safe conduct messages that will increase awareness of fire management and related activities to park visitors.

Park users and stakeholders will be made aware that the fire response and fire use direction outlined in this fire management plan is sensitive to environmental, socio-economic, and public safety considerations; and that it provides a net benefit to renewing and sustaining Quetico's ecological integrity. Additionally, effective communications are essential during fire events to minimize public concerns and reassure affected stakeholders that all appropriate measures are being taken to safeguard their well being.

Extensive tourism and recreation-based opportunities exist within and surrounding Quetico, attracting thousands of visitors to the area annually. Additionally, the proximity of Quetico to adjacent values and communities including Atikokan, Lac La Croix and developments along the Highway 11 corridor, may result in smoke management issues as a result of fires occurring. Consequently, it is necessary to keep the public; private industry; local government officials; other MNR program areas; and other government ministries and agencies informed of the direction outlined in the Quetico Provincial Park Fire Management Plan.

Key audiences that may be impacted by fire management activities and smoke management issues include but are not limited to the following stakeholders;

- Park visitors
- Community of Lac La Croix
- Outfitters and air carriers within and adjacent to Quetico
- Quetico Park interest groups
  - Friends of Quetico
  - The Quetico Foundation

- Residents and business owners in and adjacent to the Town of Atikokan
- MNR program areas
- US partners
  - Superior National Forest- Boundary Waters Canoe Area Wilderness
  - Voyageurs National Park.

## 14.2 Engagement

Engagement with stakeholders occurred throughout the development of this plan. This process included the Ontario Parks mandatory contact list (e.g. NGO's, resource user groups, forest industry, First Nation); Lac La Croix First Nation community and other local stakeholder individuals and groups. Table 4 outlines the engagement process for this plan.

**Table 4 Summary of Stakeholder Engagement**

Date	Stage of Consultation	Type of Public Engagement	Issues Raised
<b>Stage One</b>			
April 15 to May 30, 2008	Invitation to participate and opportunity to review Terms of Reference; Statement of Fire Intent.	1. EBR Policy Proposal Notice 2. Public notice directly mailed to stakeholders 3. Public Notice placed in newspapers: Thunder Bay Chronicle; Atikokan Progress and Fort Frances Times	No response received from stakeholders
April 15 – May 30, 2008	First Nations Engagement	Email requesting involvement in the planning process (October 14, 2008)  Letters mailed to Chief requesting involvement in the process (October 27 <sup>th</sup> and November 13, 2008)  Meeting with Chief in Thunder Bay to discuss community involvement to the plan (January 22, 2009)	No response from Lac la Croix First Nation

<b>Stage 2</b>			
March 18- May 7, 2009	Invitation to participate and opportunity to review Draft Quetico Forest Fire Management Plan	<ol style="list-style-type: none"> <li>1. EBR Policy Proposal update</li> <li>2. Supplemental public notice for Category B project evaluation mailed to directly to stakeholders.</li> <li>3. Supplemental public notice for Category B project evaluation placed in newspapers:: Thunder Bay Chronicle; Atikokan Progress and Fort Frances Times</li> </ol>	No response from stakeholders via EBR. One comment received from Quetico Foundation as a result of direct notice mail out to stakeholders.
March 18- May 7, 2009	First Nations Engagement	<p>Letter mailed to Chief requesting involvement in the process (March 20, 2009)</p> <p>Meeting with Chief at LCC implementation Committee meeting and handed him a copy of the plan (March 23, 2009)</p>	No response from Lac la Croix First Nation
<b>Stage 3</b>			
June 1- July 30, 2009	Final Quetico Forest Fire Management Plan	<ol style="list-style-type: none"> <li>1. EBR Decision Notice</li> <li>2. Notice of Completion mailed directly – Quetico Foundation, MOE Regional office and the Environmental Commissioner's office.</li> </ol>	

## 15.0 Costing and Funding

Any fire management plan requires consideration of costs to be incurred and funding mechanisms necessary to ensure successful implementation occurs. Every fire will incur a variety of indirect and/or direct costs depending on the fire response and use option chosen. Direct costs are defined as all costs directly attributed to a fire that would not have been accrued had there not been a fire (e.g., overtime and operational expenses charges). Indirect costs can be defined

as any costs or funds that would have been expended whether there was a fire or not (for example, regular salary and normal program operations).

Fire cost estimates are included in the fire assessment reports that are completed for all fires receiving a modified or monitored response, prescribed fire or fires that exhibit problematic control. Detailed costing and funding responsibilities are outlined within the Quetico Provincial Park Fire Operations Plan.

## **16.0 Plan Amendment and Review**

### **16.1 Amendment**

Fire managers, the Quetico Superintendent, and Quetico Park staff may propose changes to this fire management plan at any time, to ensure that the specified objectives are being met or are consistent with management direction for Quetico Provincial Park. These comments or proposals will be considered during the annual review of the Fire Management Plan. New projects will be screened for environmental effects and aboriginal/public/agency interest to determine how the plan may be amended. Amendment procedures are described in the *Class Environmental Assessment for Provincial Parks and Conservation Reserves*.

Any amendments to this plan must be approved by the Northwest Zone Manager for Ontario Parks; Quetico Provincial Park Superintendent; the Fire Management Program Manager for the West Fire Region; and the Fort Frances Fire Management Supervisor.

### **16.2 Review**

The recurring projects described in this plan will proceed for a period of up to ten years. After this time, or sooner as may be deemed necessary by MNR, the project will be formally reviewed to determine if any modifications to the fire management plan are necessary. The review will take into consideration any new environmental conditions, new government policies or new technologies for mitigating environmental effects; the results of any monitoring and reporting; and, any specific comments received during the timeframe of the plan. The results of the review may require that a new fire management plan be prepared or that the fire management plan be amended as described above.

Summaries of fire activity based on fire assessment reports and supporting documents, will be prepared at the end of each fire season. The objectives outlined in this management plan will be reviewed annually and compared to these fire activity summaries and the management direction outlined in Quetico's Fire Management Plan. The review will also include monitoring assessment and reporting activities that have been conducted within Quetico. If any of these activities indicate that plan objectives are not being met, a change in plan implementation may be warranted and will be considered an administrative amendment.



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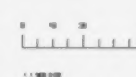


Quetico

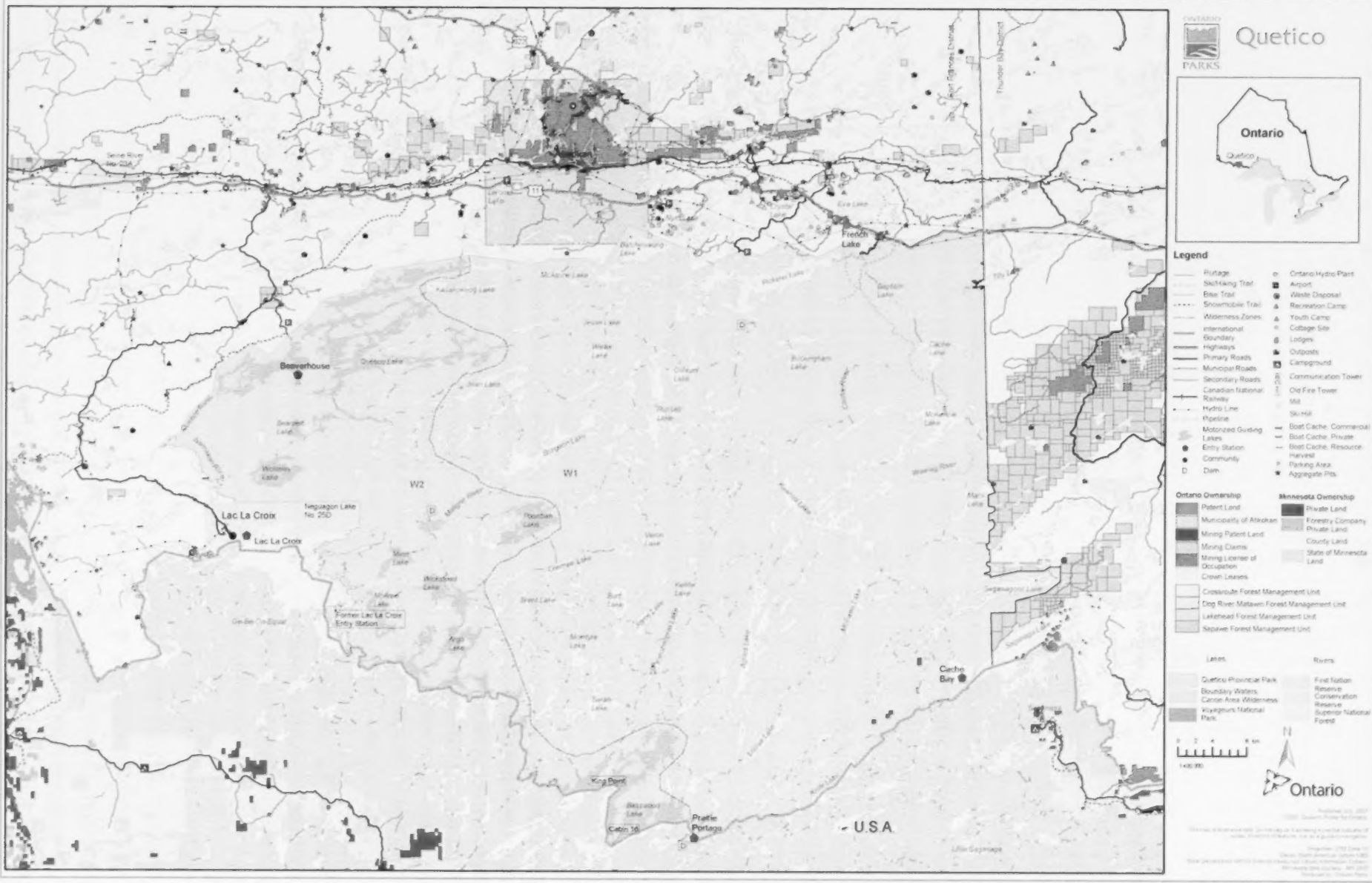


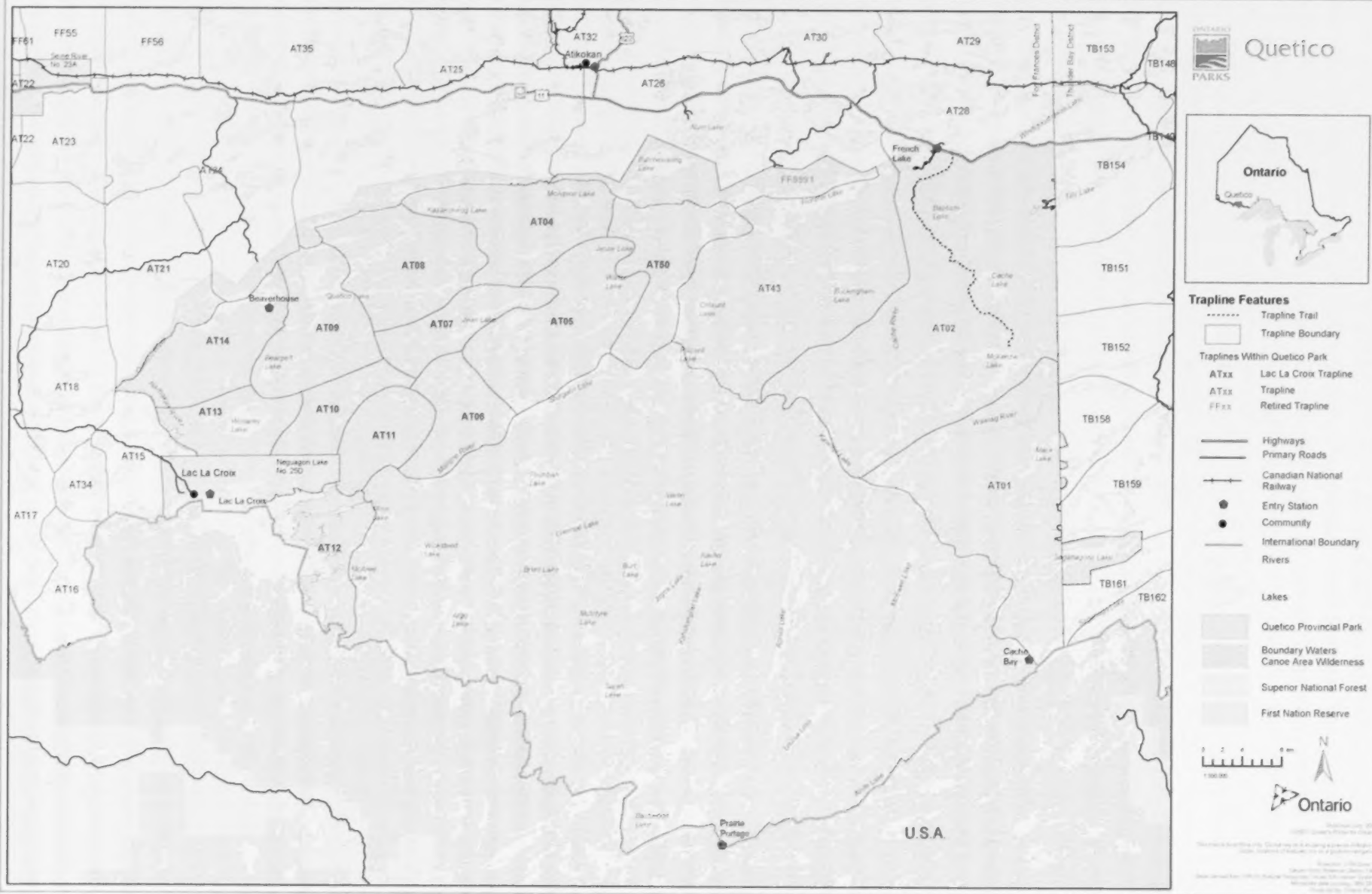
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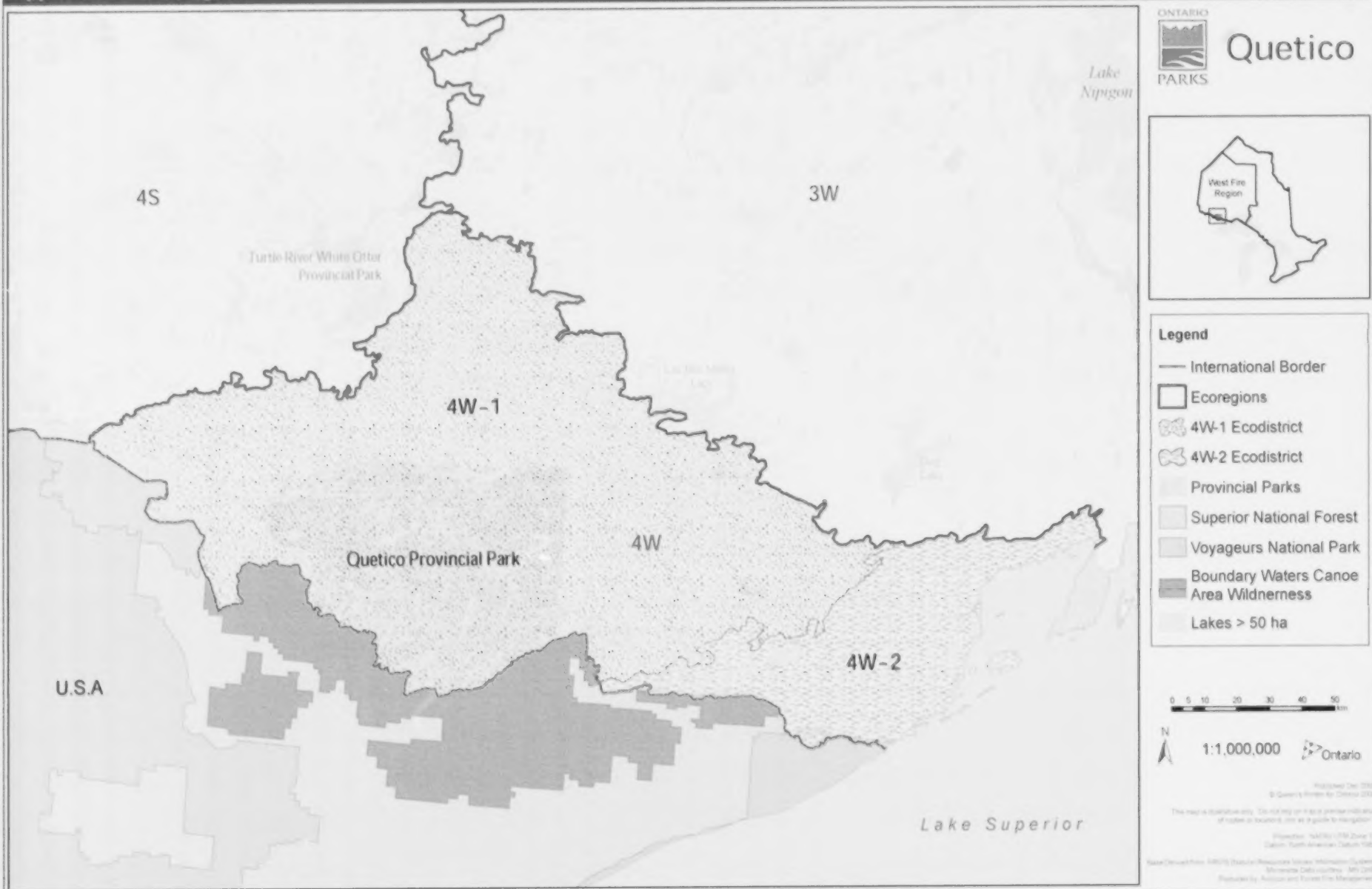
- Community
- First Nation Community
- First Nation Reserve
- Highways
- Primary Roads
- Railway
- International Boundary
- Rivers
- Major Lakes
- Ontario Provincial Parks
- Boundary Waters Canoe Area Wilderness
- Superior National Forest
- Voyageurs National Park



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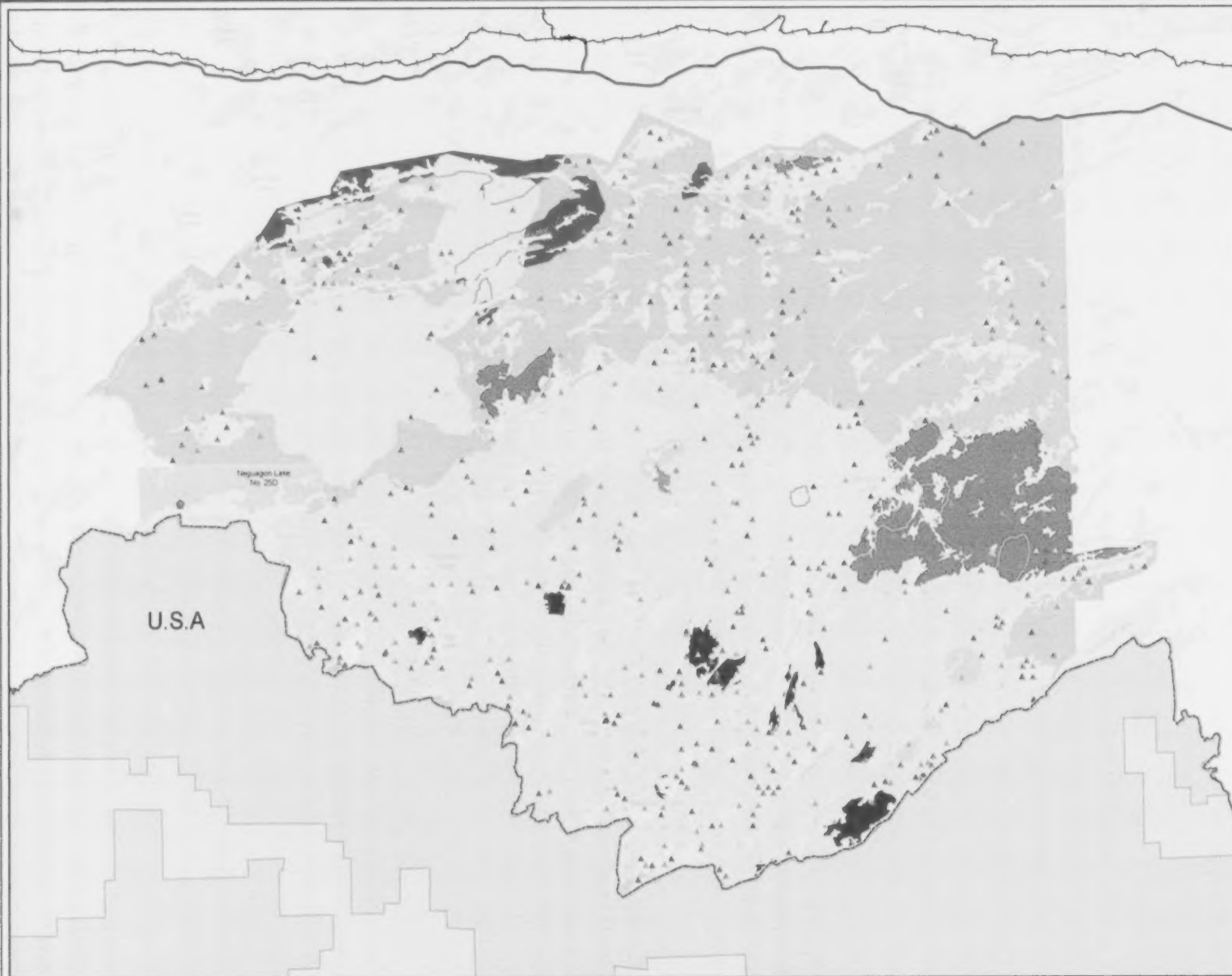








# Quetico



## Legend

Large Fires*	Point Fires
2000 - 2008	▲ 2000 - 2007
1990 - 1999	▲ 1990 - 1999
1980 - 1989	▲ 1980 - 1989
1970 - 1979	▲ 1970 - 1979
1960 - 1969	▲ 1960 - 1969
1950 - 1959	
1940 - 1949	
1930 - 1939	
1920 - 1929	

\* Large Fires defined as:  
 >200 ha (1930 - 1999)  
 >40 ha (2000 - 2007)

● Community	■ Hunter Island
— Highway	■ Quetico Park
— CN Railway	■ First Nation Reserve
— International Border	■ Superior National Forest
○ Lakes > 50 ha	■ Boundary Waters Canoe Area Wilderness

0 2.5 5 10 15 20 km



1:350,000



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 Projection: NAD83 UTM Zone 18  
 Datum: North American Datum 1983  
 Data Derived from: ESRD (National Resources Values Information System)  
 Ministry of Natural Resources - MNR 1204  
 Produced by: Analysis and Forest Fire Management





## Quetico



### Legend

#### Fires

▲ Other (Human)

△ Lightning

— International Border

— CN Railway

— Highway

■ Quetico Park

■ First Nation Reserve

■ Superior National Forest

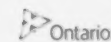
■ Boundary Waters Canoe Area Wilderness

■ Lakes > 50 ha

0 2.5 5 10 15 20 km



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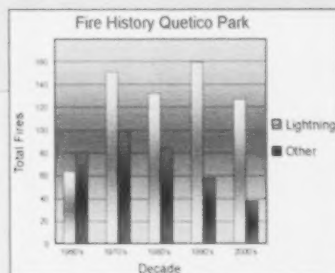


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Projection: NAD83 UTM Zone 18  
Datum: North American Datum 1983

Data Derived from: SAGIS (Natural Resources Canada Information Systems)  
MapData Data courtesy: MFLDP  
Produced by: Analysis and Forest Fire Management



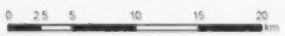


# Quetico



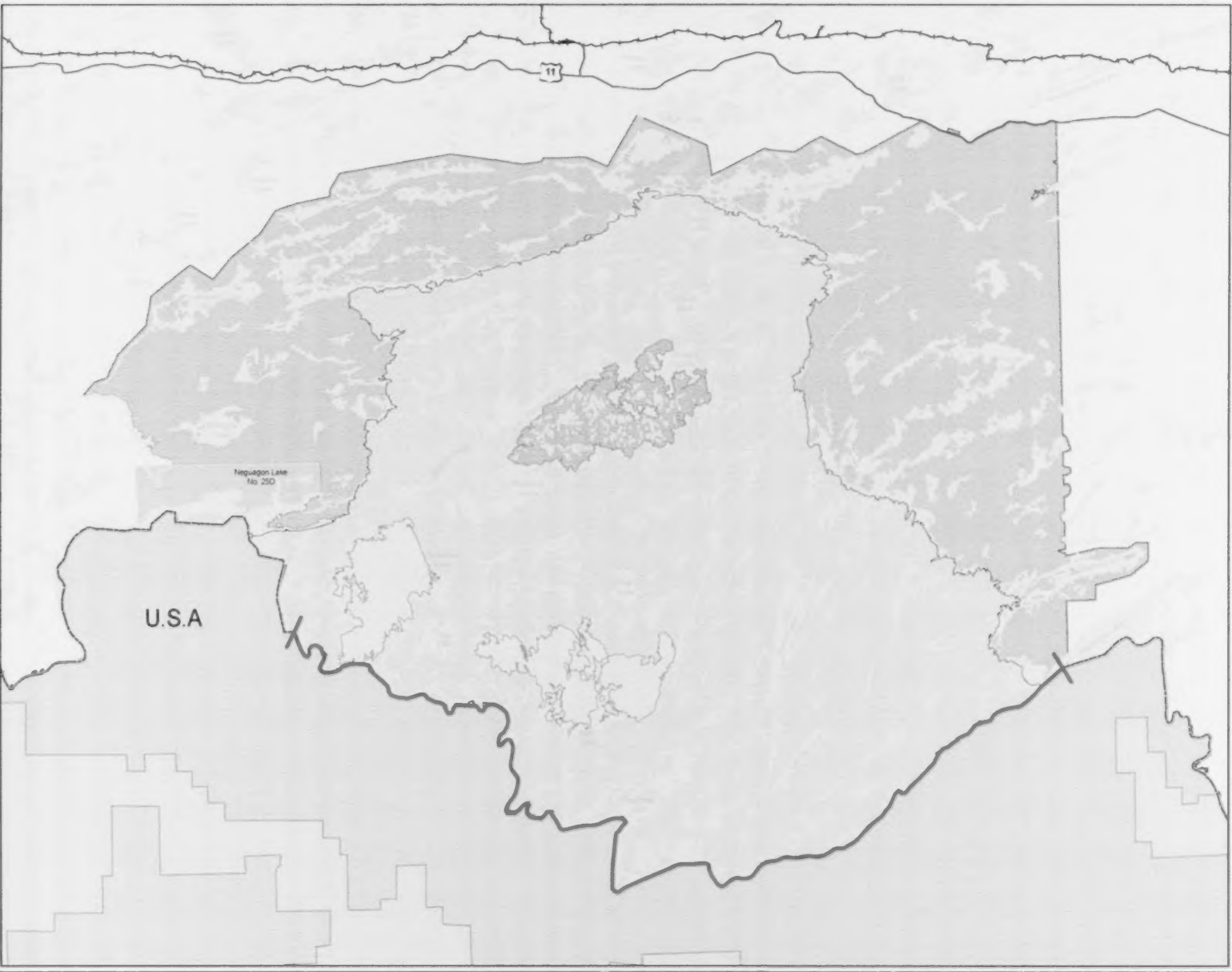
**Legend**

- Highway
- Cross Border Fire Zone
- International Border
- Compartment 1
- Compartment 2
- Compartment 3
- Compartment 4
- First Nation Reserve
- Superior National Forest
- Boundary Waters Canoe Area Wilderness
- Lake > 50 ha



N  
1:350,000  
Ontario

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Projection: NAD83 UTM Zone 18  
Datum: North American Datum 1983  
Base Derived from: NAD83 Ontario Roadwork Information System  
Map Data Courtesy: MTO Data  
Produced by: Aviation and Forest Fire Management



## Appendix H: Screening Criteria- Managed Fire

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
■ Values for which the provincial park or conservation reserve was established								X	Maintain/enhance ecological integrity
<b>Natural Environment Considerations</b>									
■ Air quality			X						Dependent upon fire size
■ Water quality or quantity (ground or surface)				X					Part of natural process; short-term low negative impact (sedimentation/nutrient flux), potential neutral long-term impact
■ Species at risk or their habitat				X					No terrestrial SAR that are listed by COSSARO or COSEWIC
■ Significant earth or life science features					x				Effects may be positive or negative, depending on the species affected. Some rare species in the park are fire dependent, while some are not.
■ Fish or other aquatic species, communities, or their habitat (including numbers, diversity and movement of resident or migratory species)					x				Potential effects may be increased organic carbon, chlorophyll and limnoplankton biomass – not significant loss to fish biomass except with short term effects on white sucker May have positive effects in lowering concentrations of Methyl mercury, but not enough research.
■ Land subject to natural or human-made hazards							X		Reduce blowdown/infestations & hazards within park; increase public safety
■ Recovery of a species under a special management program (e.g. elk restoration)				X					Na
■ Ecological integrity								X	Fire is a natural ecosystem process within the boreal and great lakes forests and is needed to maintain biodiversity
■ Terrestrial wildlife (including numbers, diversity and movement of resident or migratory species)							X		Creates early, and within a few years, secondary successional forests, may also decrease canopy cover in understory burns. Not only is this critical to maintain fire dependant community types, but also critical for many wildlife species that really on these disturbances for the creation of habitat, breeding, and foraging, including, moose, black-backed woodpecker, lynx, bear, many insect

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
									species, plants such as Bicknell's Geranium, fireweed, some liverwort species.
■ Natural vegetation and terrestrial habitat linkages or corridors through fragmentation, alteration and/or critical loss							X		Naturally occurring corridors developed by fire occurrence
■ Permafrost				X					Na
■ Soils and sediment quality							X		Increase nutrients into soil (nutrient cycling)
■ Drainage or flooding				X					Based upon history of fires in Quetico, drainage and flooding has not been a concern
■ Sedimentation or erosion			X						Potential short-term negative impact; increased sedimentation and erosion
■ Release of contaminants in soils, sediments					X				No known areas of potential large-scale contaminant deposits; ex. Mercury
■ Natural heritage features and areas (e.g. areas of natural and scientific interest, provincially significant wetlands)				X					Wetlands have not been evaluated for significance in Quetico. No ANSI's in park. No natural features would be negatively impacted.
■ Other (specify)									
<b>Land Use, Resource Management Considerations</b>									
■ Remoteness (access inaccessible areas)				X					
■ Navigation				X					May be re-directed to safer areas when fire occurring
■ Other projects within a park or reserve							X		Provides current and future opportunities for fire behaviour, impacts, and post-fire monitoring to be studied; values assessed on each fire and appropriate response determined
■ Other projects outside a park or reserve						X			Provides opportunity for neighbouring agencies to meet mutually beneficial objectives
■ Traffic patterns or traffic infrastructure			X						Visitors may be re-routed to areas where there is possible congestion for public safety reasons; short-term
■ Public or private recreation			X						Wilderness experience may be impacted if re-routing is required for public safety reasons
■ Or create excessive waste materials					X				
■ Or commit a significant amount of a non-renewable resource (e.g. aggregates, agricultural land)				X					
■ Noise levels			X						Potential impact on wilderness experience by presence of aircraft; few complaints related

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
									to fire monitoring aircraft over the past 10 years
■ Views or aesthetics							X		Public perception of fire on the landscape within Quetico has been positive over the last 10 years
■ Another project or be a precondition or justification for implementing another project								X	Provides opportunities for fire science research; results of these studies can be applicable within and outside of Quetico
■ Uses, persons or property outside a park or reserve			X						Potential to impact LLC, BWCAW, property owners and SFL holders adjacent to Quetico (ex. Smoke, fire escape)
■ Other (specify)									
<b>Social, Cultural, and Economic Considerations</b>									
■ Archaeology			X						Fire suppression efforts and fire occurrence may impact or damage or expose artifacts, but fire also has potential to expose artifacts which provides an opportunity for cultural studies
■ Built heritage				X					FAR reporting process accounts for values within the park and measures are taken to ensure values protection
■ Cultural heritage landscapes							X		Fire is a natural ecosystem process within this area
■ Sacred or traditional use sites				X					Known sites are accounted for in the values assessment of the FAR and protected accordingly
■ Or displace people, businesses, institutions, or public facilities				X					
■ Community character, enjoyment of property, or local amenities						X			Over the past 10 years, very little impact has been seen on visitor enjoyment of the park during fire season; no known impact on other users; promotes wilderness experience by allowing fire to fulfil its ecological role
■ Demands on government services or infrastructure			X						Increased demand by park and fire resources for monitoring fires & communications with park visitors; priority setting in place and programs adapted accordingly
■ Public health and/or safety				X					FAR system accounts for immediate impacts, however indirect impacts have not been reported

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
									in the last 10 years; fire occurrence reduces hazards therefore threat to public safety
■ Local, regional or provincial economies or businesses						X			Purchasing of supplies/services, providing employment, and providing long-term research opportunities
■ Tourism values (e.g. resource-based tourist lodge)			X						Smoke/ re-routing has the potential to affect guests and logistics of local outfitters
■ Other (specify)									
<b>Aboriginal Considerations</b>									
■ First Nation reserves or communities				X					Generally due to the location of the reserve Quetico, the community potentially will not be impacted by fires in Quetico; FAR assesses potential impacts and provides appropriate level of protection
■ Spiritual, ceremonial, or cultural sites				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Traditional land or resources uses, or affect economic activities			X						Fire has positive impact on ecological integrity of area; potential for short-term negative economic impact on traplines and resource extraction
■ Aboriginal values				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Lands subject to land claims				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Other: Traditional knowledge/use of fire						X			Historically, fire has been utilized by First Nation communities as a tool for vegetation manipulation



## Appendix I: Screening Criteria- Prescribed Fire (Stand Maintenance)

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
<ul style="list-style-type: none"> <li>Values for which the provincial park or conservation reserve was established</li> </ul>								X	Maintain/enhance ecological integrity
<b>Natural Environment Considerations</b>									
<ul style="list-style-type: none"> <li>Air quality</li> </ul>		X							Dependent upon fire size; more intense fire results in increased smoke particulates in air
<ul style="list-style-type: none"> <li>Water quality or quantity (ground or surface)</li> </ul>			X						Part of natural process; short-term low negative impact (sedimentation/nutrient flux), potential neutral long-term impact
<ul style="list-style-type: none"> <li>Species at risk or their habitat</li> </ul>						X			No terrestrial SAR that are listed by COSSARO or COSEWIC
<ul style="list-style-type: none"> <li>Significant earth or life science features</li> </ul>					X				Effects may be positive or negative, depending on the species affected. Some rare species in the park are fire dependent, while some are not.
<ul style="list-style-type: none"> <li>Fish or other aquatic species, communities, or their habitat (including numbers, diversity and movement of resident or migratory species)</li> </ul>					X				Potential effects may be increased organic carbon, chlorophyll and limnoplankton biomass – not significant loss to fish biomass except with short term effects on white sucker May have positive effects in lowering concentrations of Methyl mercury, but not enough research.
<ul style="list-style-type: none"> <li>Land subject to natural or human-made hazards</li> </ul>							X		Reduce blowdown/infestations & hazards within park; increase public safety
<ul style="list-style-type: none"> <li>Recovery of a species under a special management program (e.g. elk restoration)</li> </ul>				X					
<ul style="list-style-type: none"> <li>Ecological integrity</li> </ul>								X	Fire is a natural ecosystem process within the boreal and great lakes forests
<ul style="list-style-type: none"> <li>Terrestrial wildlife (including numbers, diversity and movement of resident or migratory species)</li> </ul>			X						Decrease in habitat and feeding areas during short-term; long-term increased feeding areas, habitat; dependent upon size of fire
<ul style="list-style-type: none"> <li>Natural vegetation and terrestrial habitat linkages or corridors through fragmentation, alteration and/or critical loss</li> </ul>							X		Potential increase in fragmentation associated with larger fire size; well-developed corridors created by fire occurrence
<ul style="list-style-type: none"> <li>Permafrost</li> </ul>				X					Fires generally occur between May & September
<ul style="list-style-type: none"> <li>Soils and sediment quality</li> </ul>		X							Potential for greater release of nutrients from soil and degradation of soil quality

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
■ Drainage or flooding			X						Heavy rain events immediately after fire have potential for increased flooding associated with greater surface run-off
■ Sedimentation or erosion		X							Potential short-term negative impact; increased sedimentation and erosion
■ Release of contaminants in soils, sediments			X						Potential to result in an increase in contaminant release from soil
■ Natural heritage features and areas (e.g. areas of natural and scientific interest, provincially significant wetlands)				X					Wetlands have not been evaluated for significance in Quetico. No ANSI's in park. No natural features would be negatively impacted.
■ Other (specify)									
<b>Land Use, Resource Management Considerations</b>									
■ Remoteness (access inaccessible areas)				X					
■ Navigation			X						May be re-directed to safer areas when fire occurring
■ Other projects within a park or reserve							X		Provides current and future opportunities for fire behaviour, impacts, and post-fire monitoring to be studied; values assessed on each fire and appropriate response determined
■ Other projects outside a park or reserve			X						Provides opportunity for neighbouring agencies to meet mutually beneficial objectives; potential to have greater impact on values outside of the park (less ability to control potential for fire escape)
■ Traffic patterns or traffic infrastructure		X							Increased number of visitors may be re-routed to areas where there is possible congestion for public safety reasons; short-term
■ Public or private recreation			X						Wilderness experience may be impacted if re-routing is required for public safety reasons
■ Or create excessive waste materials					X				
■ Or commit a significant amount of a non-renewable resource (e.g. aggregates, agricultural land)				X					
■ Noise levels		X							Potential impact on wilderness experience by presence of aircraft; few complaints related to fire monitoring aircraft over the past 10 years; more aircraft activity associated with higher-risk fires

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
■ Views or aesthetics						X			Public perception of fire on the landscape within Quetico has been positive over the last 10 years; short-term succession is reset; long-term healthier ecosystem
■ Another project or be a precondition or justification for implementing another project								X	Provides opportunities for fire science research; results of these studies can be applicable within and outside of Quetico
■ Uses, persons or property outside a park or reserve		X							Potential to impact LLC, BVCAW, property owners and SFL holders adjacent to Quetico (ex. Smoke, fire escape)
■ Other (specify)									
<b>Social, Cultural, and Economic Considerations</b>									
■ Archaeology		X							Fire suppression efforts and fire occurrence may impact or damage or expose artifacts
■ Built heritage			X						FAR reporting process accounts for values within the park and measures are taken to ensure values protection; potential for movement of campers to place a greater impact on existing campsites in other areas
■ Cultural heritage landscapes							X		Fire is a natural ecosystem process within this area
■ Sacred or traditional use sites				X					Known sites are accounted for in the values assessment of the FAR and protected accordingly
■ Or displace people, businesses, institutions, or public facilities			X						People may be relocated to other areas due to closure zones or travel restrictions
■ Community character, enjoyment of property, or local amenities						X			Over the past 10 years, very little impact has been seen on visitor enjoyment of the park during fire season; no known impact on other users; promotes wilderness experience by allowing fire to fulfil its ecological role
■ Demands on government services or infrastructure		X							Increased demand by park and fire resources for monitoring fires &

<sup>2</sup> Where projects may affect a known or suspected cultural resource, further technical heritage studies may be warranted. Technical studies that may be required include items such as archaeological assessments by licensed archaeologists and built heritage studies by qualified heritage consultants if a significant built heritage structural feature is being affected.

MNR shall develop a technical guideline, in consultation with the Ministry of Culture, to address how cultural heritage resources should be identified, and how to assess their significance and develop mitigation techniques.

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
									communications with park visitors; priority setting in place and programs adapted accordingly
■ Public health and/or safety			X						FAR system accounts for immediate impacts, however indirect impacts have not been reported in the last 10 years; fire occurrence reduces hazards therefore threat to public safety
■ Local, regional or provincial economies or businesses							X		Purchasing of supplies/services, providing employment, and providing long-term research opportunities
■ Tourism values (e.g. resource-based tourist lodge)			X						Smoke/ re-routing has the potential to affect guests and logistics of local outfitters
■ Other (specify)									
<b>Aboriginal Considerations</b>									
■ First Nation reserves or communities				X					Generally due to the location of the reserve Quetico, the community potentially will not be impacted by fires in Quetico; FAR assesses potential impacts and provides appropriate level of protection
■ Spiritual, ceremonial, or cultural sites				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Traditional land or resources uses, or affect economic activities		X							Fire has positive impact on ecological integrity of area; potential for short-term negative economic impact on traplines and resource extraction
■ Aboriginal values				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Lands subject to land claims				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Other: Traditional knowledge/use of fire						X			Historically, fire has been utilized by First Nation communities as a tool for vegetation manipulation

## Appendix J: Screening Criteria- Prescribed Fire (stand replacing)

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
<ul style="list-style-type: none"> <li>Values for which the provincial park or conservation reserve was established</li> </ul>								X	Maintain/enhance ecological integrity
<b>Natural Environment Considerations</b>									
<ul style="list-style-type: none"> <li>Air quality</li> </ul>		X							Dependent upon fire size; more intense fire results in increased smoke particulates in air
<ul style="list-style-type: none"> <li>Water quality or quantity (ground or surface)</li> </ul>			X						Part of natural process; short-term low negative impact (sedimentation/nutrient flux), potential neutral long-term impact
<ul style="list-style-type: none"> <li>Species at risk or their habitat</li> </ul>						X			No terrestrial SAR that are listed by COSSARO or COSEVIC
<ul style="list-style-type: none"> <li>Significant earth or life science features</li> </ul>					X				Effects may be positive or negative, depending on the species affected. Some rare species in the park are fire dependent, while some are not.
<ul style="list-style-type: none"> <li>Fish or other aquatic species, communities, or their habitat (including numbers, diversity and movement of resident or migratory species)</li> </ul>					X				Potential effects may be increased organic carbon, chlorophyll and limnoplankton biomass – not significant loss to fish biomass except with short term effects on white sucker May have positive effects in lowering concentrations of Methyl mercury, but not enough research.
<ul style="list-style-type: none"> <li>Land subject to natural or human-made hazards</li> </ul>							X		Reduce blowdown/infestations & hazards within park; increase public safety
<ul style="list-style-type: none"> <li>Recovery of a species under a special management program (e.g. elk restoration)</li> </ul>				X					
<ul style="list-style-type: none"> <li>Ecological integrity</li> </ul>								X	Fire is a natural ecosystem process within the boreal and great lakes forests
<ul style="list-style-type: none"> <li>Terrestrial wildlife (including numbers, diversity and movement of resident or migratory species)</li> </ul>			X						Decrease in habitat and feeding areas during short-term; long-term increased feeding areas, habitat; dependent upon size of fire
<ul style="list-style-type: none"> <li>Natural vegetation and terrestrial habitat linkages or corridors through fragmentation, alteration and/or critical loss</li> </ul>							X		Potential increase in fragmentation associated with larger fire size; well-developed corridors created by fire occurrence
<ul style="list-style-type: none"> <li>Permafrost</li> </ul>				X					Fires generally occur between May & September
<ul style="list-style-type: none"> <li>Soils and sediment quality</li> </ul>		X							Potential for greater release of nutrients from soil and degradation of



Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
									soil quality
■ Drainage or flooding			X						Heavy rain events immediately after fire have potential for increased flooding associated with greater surface run-off
■ Sedimentation or erosion		X							Potential short-term negative impact; increased sedimentation and erosion
■ Release of contaminants in soils, sediments			X						Potential to result in an increase in contaminant release from soil
■ Natural heritage features and areas (e.g. areas of natural and scientific interest, provincially significant wetlands)				X					Wetlands have not been evaluated for significance in Quetico. No ANSI's in park. No natural features would be negatively impacted.
■ Other (specify)									
<b>Land Use, Resource Management Considerations</b>									
■ Remoteness (access inaccessible areas)				X					
■ Navigation			X						May be re-directed to safer areas when fire occurring
■ Other projects within a park or reserve							X		Provides current and future opportunities for fire behaviour, impacts, and post-fire monitoring to be studied; values assessed on each fire and appropriate response determined
■ Other projects outside a park or reserve			X						Provides opportunity for neighbouring agencies to meet mutually beneficial objectives; potential to have greater impact on values outside of the park (less ability to control potential for fire escape)
■ Traffic patterns or traffic infrastructure		X							Increased number of visitors may be re-routed to areas where there is possible congestion for public safety reasons; short-term
■ Public or private recreation			X						Wilderness experience may be impacted if re-routing is required for public safety reasons
■ Or create excessive waste materials					X				
■ Or commit a significant amount of a non-renewable resource (e.g. aggregates, agricultural land)				X					
■ Noise levels		X							Potential impact on wilderness experience by presence of aircraft; few complaints related to fire monitoring aircraft over the past 10 years; more aircraft activity associated with higher-

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
									risk fires
■ Views or aesthetics						X			Public perception of fire on the landscape within Quetico has been positive over the last 10 years; short-term succession is reset; long-term healthier ecosystem
■ Another project or be a precondition or justification for implementing another project								X	Provides opportunities for fire science research; results of these studies can be applicable within and outside of Quetico
■ Uses, persons or property outside a park or reserve		X							Potential to impact LLC, BWCAW, property owners and SFL holders adjacent to Quetico (ex. Smoke, fire escape)
■ Other (specify)									
<b>Social, Cultural<sup>3</sup>, and Economic Considerations</b>									
■ Archaeology		X							Fire suppression efforts and fire occurrence may impact or damage or expose artifacts
■ Built heritage			X						FAR reporting process accounts for values within the park and measures are taken to ensure values protection; potential for movement of campers to place a greater impact on existing campsites in other areas
■ Cultural heritage landscapes							X		Fire is a natural ecosystem process within this area
■ Sacred or traditional use sites				X					Known sites are accounted for in the values assessment of the FAR and protected accordingly
■ Or displace people, businesses, institutions, or public facilities			X						People may be relocated to other areas due to closure zones or travel restrictions
■ Community character, enjoyment of property, or local amenities						X			Over the past 10 years, very little impact has been seen on visitor enjoyment of the park during fire season; no known impact on other users; promotes wilderness experience by allowing fire to fulfil its ecological role
■ Demands on government services or		X							Increased demand by

<sup>3</sup> Where projects may affect a known or suspected cultural resource, further technical heritage studies may be warranted. Technical studies that may be required include items such as archaeological assessments by licensed archaeologists and built heritage studies by qualified heritage consultants if a significant built heritage structural feature is being affected.

MNR shall develop a technical guideline, in consultation with the Ministry of Culture, to address how cultural heritage resources should be identified, and how to assess their significance and develop mitigation techniques.

Screening Criteria "This project may affect ..."	Rating of Potential Net Effect								Comments, Rationale
	-H	-M	-L	Nil	Unk	+L	+M	+H	
infrastructure									park and fire resources for monitoring fires & communications with park visitors; priority setting in place and programs adapted accordingly
■ Public health and/or safety			X						FAR system accounts for immediate impacts, however indirect impacts have not been reported in the last 10 years; fire occurrence reduces hazards therefore threat to public safety
■ Local, regional or provincial economies or businesses							X		Purchasing of supplies/services, providing employment, and providing long-term research opportunities
■ Tourism values (e.g. resource-based tourist lodge)			X						Smoke/ re-routing has the potential to affect guests and logistics of local outfitters
■ Other (specify)									
<b>Aboriginal Considerations</b>									
■ First Nation reserves or communities				X					Generally due to the location of the reserve Quetico, the community potentially will not be impacted by fires in Quetico; FAR assesses potential impacts and provides appropriate level of protection
■ Spiritual, ceremonial, or cultural sites				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Traditional land or resources uses, or affect economic activities		X							Fire has positive impact on ecological integrity of area; potential for short-term negative economic impact on traplines and resource extraction
■ Aboriginal values				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Lands subject to land claims				X					FAR assesses potential impacts on values and provides appropriate level of protection on known values
■ Other: Traditional knowledge/use of fire						X			Historically, fire has been utilized by First Nation communities as a tool for vegetation manipulation

